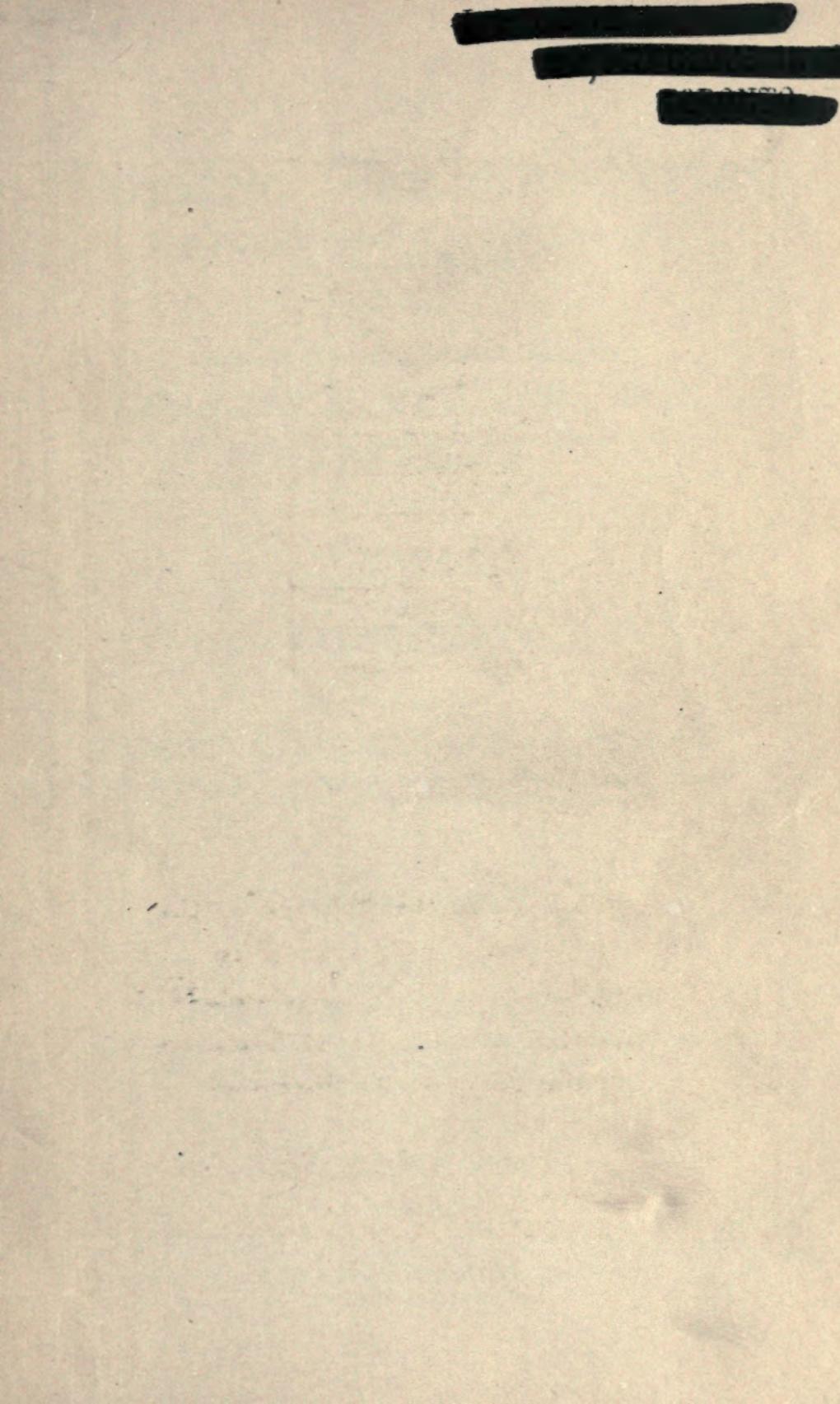


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Comprising Eight Volumes on the Year's Progress in
Medicine and Surgery

Under the General Editorial Charge of

CHARLES L. MIX, A. M., M. D.

Professor of Physical Diagnosis in the Northwestern
University Medical School

Volume V

Gynecology

EDITED BY

EMILIUS C. DUDLEY, A. M., M. D., LL. D.

Professor of Gynecology, Northwestern University Medical School; Gynecologist to
St. Luke's and Wesley Hospitals, Chicago

Obstetrics

EDITED BY

JOSEPH B. DE LEE, A. M., M. D.

Professor of Obstetrics, Northwestern University Medical School; Attending
Obstetrician Chicago Lying-in and Mercy Hospitals; Consulting
Obstetrician Provident and Evanston Hospitals

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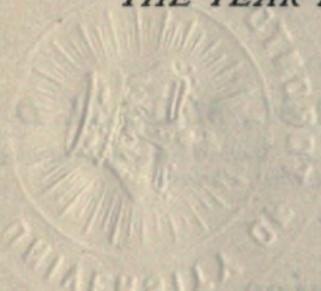
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GYNECOLOGY.

PART I.

GENERAL PRINCIPLES.

ANATOMY AND PHYSIOLOGY.

Muscular Strength of College Women. In a preliminary paper on this subject, C. D. Mosher and E. G. Martin¹ consider the distribution especially. Martin's method of testing originally devised for study of poliomyelitis, was used. Forty-five average healthy women, most of whom had always been physically active, although, in the majority not specially athletic, were studied.

AVERAGE STRENGTHS BY AGE GROUPS.

Ages	16-20	20-25	25-35	35-56	All Ages
No. of cases.....	10	26	5	4	45
Average strength factor.....	21.5	23.8	23	20.8	22.5
Maximum strength factor.....	26.6	30.4	25.3	25.3	30.4
Minimum strength factor.....	18.4	19.3	18.7	16.6	16.6

They find there is no difference in the strength of women and men due to sex as such. Such differences as are frequently found are due to differences in the use of the muscles, brought about by the conventional limitations of activity or by dress. Marked over- or underweight tends to lower the strength factor, as does also lack of coordination, too frequent in women and exaggerated by their scant physical activity in childhood. The effects of muscular training persist long after the particular exercise has ceased. A high degree of muscular power in a woman in no way lessens her racial efficiency. Lack of power, as in the pectoral muscles, may be a distinct racial disability.

(1) Jour. Amer. Med. Ass'n., Jan. 19, 1918.

Periodic disability in a woman when no organic disease exists is readily eliminated. If some method be found of adjusting work to the individual strength under proper hygienic conditions, without reference to sex, there is no reason why the potential power of woman may not be used without danger of lessening her racial efficiency.

Interpretation of Lumbo-Sacral Backache. Regardless of this, E. H. Richardson² says the determination of the specific cause of lumbo-sacral backache involves a careful study both in the domain of the orthopedist and in that of the gynecologist. In the former, we must scrutinize the lower spine, the lumbo-sacral and sacroiliac articulations very closely for evidences (1) of arthritis; (2) injury; and (3) chronic strain. In the latter the point to remember is that, with rare exceptions, whatever the nature of the particular gynecologic disorder, it produces back-ache only through the strain incident upon faulty posture, and no matter how skilfully our operative therapy is executed, it will often fail utterly to relieve the backache unless supplemented by orthopedic measures which will restore normal balance.

Auto- and Homotransplantation of Uterus in Guinea-Pig. C. Hesselberg, W. Kerwin and Leo Loeb³ obtained the following results: Soon after transplantation only small parts of peripheral tissue are preserved. Gradually a recovery of shrunken tissue occurs in addition to new formation of tissue through cell proliferation. There are indications that different tissues show a different degree of resistance to the injury. Unstriated muscle was found to recover later than epithelial structures and peritoneal endothelium. While after homotransplantation of uterus, as well as of thyroid and kidney, substances (homotoxins) are produced which attract lymphocytes, the reaction is quantitatively stronger after homotransplantation of thyroid and kidney. After homotransplantation of the uterus the homotoxins exert a primary injurious influence on muscle and connective tissue, which suffer directly. The epithelium suffers

{2} Southern Med. Jour., February, 1918.
(3) Jour. of Med. Research, March, 1918.

secondarily, probably as a result of the changes in the stroma, and to a minor extent through activity of the lymphocytes.

On the other hand, after homotransplantation of kidney and thyroid, the chief injury is inflicted on the transplanted tissue through lymphocytes and (to a less extent) connective tissue cells of the host. In both cases epithelial structures are more resistant and are least injured through the direct influence of the homotoxins. They are injured or destroyed as a result of the attack by the cellular elements of the host. The connective tissue and muscle of the uterus are injured directly through the homotoxins and only secondarily by cells of the host. The differences in cell proliferation between the normal uterine epithelium, on the one hand, and kidney and thyroid on the other, persist after auto-transplantation. It is probable they are due to primary differences in the constitution of these varieties of cells.

Action of "Female Remedies" on Intact Uteri of Animals. In the 1917 volume (p. 9) reference was made to J. D. Pilcher's researches on the action of these remedies on the *excised* uterus. In a recent paper with R. T. Mauer,⁴ he gives the results of similar investigations on the *intact* uterus.

In his former paper he showed that while a number of preparations affect the activity of strips of the excised uterus, they have a similar action on intestine, so the action was considered to be on smooth muscle in general and not specific to the uterus. Further, from the concentration necessary to demonstrate their actions on excised tissues it was concluded that doses too large to be tolerated would be required to display a similar action on the intact organism. The present study was undertaken to settle these questions, for there was a possibility that the drugs might influence the uterus through a central action, although there is no pharmacologic basis for this view.

The experiments demonstrate conclusively that the entire list of *female remedies* are quite void of action on the uterus *in situ*. They can not, therefore, influence the tone or contractions of the uterus through any cen-

tral innervation or through the blood, no matter whether the uterus is in a state of normal, increased or decreased tone. The following were all inactive in doses far above the average therapeutic dose: unicorn root, pulsatilla,

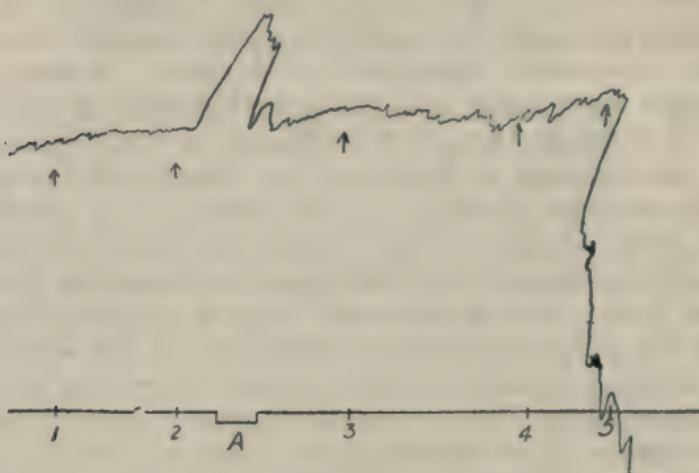


Fig. 1. The action of several drugs on the movements of the intact uterus of a virgin dog. The upper curve is a record of the contractions; the base line is below; *A* represents 60 seconds. (1, 2, 4,) the drugs were injected by vein in doses of 0.04 cubic centimeter per kilogram; Jamaica dogwood, pulsatilla, and blue cohosh respectively. This dose made a concentration of about 1:1000 in the blood. At 2 a small dose of histamin was given and at 5 an injection of epinephrin, the latter causing the lever to fall below the base line. The tracing was interrupted between 3 and 4 (Pilcher and Mauer).

Jamaica dogwood, figwort, valerian, lady's slipper, wild yam, life root, skull cap, blue cohosh, Viburnum prunifolium, cramp bark, squaw vine, false unicorn, passion flower and motherwort.

THE RELATION OF THE GLANDS OF INTERNAL SECRETION TO GYNECOLOGY.

A symposium on this subject⁵ at the 1917 meeting of the American Gynecological Society was participated in by several speakers—

Relation of the Pituitary Gland to the Female Generative Organs. E. Goetsch drew the following conclusions: There is a close interrelationship between the

(5) Amer. Jour. of Obstetrics, October, 1917.

pituitary and sex glands, supported by abundant experimental evidence and numerous observations on pituitary disturbances in the human subject.

Overfunction of the anterior lobe is associated with overactivity of the sex glands. Deficiency of pituitary secretion is followed by underdevelopment and genital aplasia in the young and by sexual inactivity and retrogression in the adult. Primary alterations in the function of the sex glands, as in pregnancy and after castration, are followed by pituitary hypertrophy and hyperplasia.

The specific action of posterior lobe extract upon the smooth musculature of uterus and bowel has led to its wide usage in obstetrics and in intestinal paresis following operations. Pituitary extracts are of distinct benefit in pituitary underfunction.

Relation of the Parathyroid System to the Female Genital Apparatus. Concerning this aspect, E. H. Pool stated the following as his conclusions:

No direct relationship has been established between the parathyroids and the female sex organs; no morphologic changes in the parathyroids have been noted during pregnancy; yet apparently there is a connection between the parathyroids and the *sex processes* in the female.

Tetany, the clinical evidence of insufficient parathyroid function, is somewhat prone to occur in menstruating, pregnant and puerperal women, as well as patients suffering from gynecologic diseases or have undergone operations.

The cause of maternal tetany is now referred to parathyroid insufficiency. There is reason to believe that maternal and lactation tetany are associated with calcium deficiency. Latent tetany, or a subtetanic condition, is much more common in pregnant and puerperal women than is usually assumed.

In the treatment of maternal tetany, calcium in large doses is followed by beneficial results in the great majority.

The Thyroid in Relation to Gynecology. According to D. Marine, there is evidence of a thyroid sex gland interrelation recognizable in the female in association

with the development of secondary sexual characters, with menstruation and with pregnancy and also (slightly) in the male at puberty. The meager evidence available would indicate that the interstitial cells of the ovary and perhaps, also, the adrenal cortex play a major rôle in this relation in the female, as certainly the cells of Leydig do in the male.

The thyroid enlargement is of the nature of a work hypertrophy to stimulate metabolism identical in appearance and so far as we know, different only in degree from that in simple goiter. Both of these reactions can be controlled and prevented either indirectly by giving iodine, or directly by giving the iodine-containing hormone in physiologic doses.

The Endocrine Function of the Pancreas and its Relation to the Sex Life of Women. This is dwelt on by A. J. Carlson, who points out that all evidence supports the view that some substance secreted by the islands of Langerhans into the blood is necessary for utilization of sugar by the tissues. This function is specific for the pancreas. Other endocrine organs may influence sugar metabolism in a superficial way by altering the sugar mobilization (adrenals, thyroid), or by increasing or decreasing the rate of oxidation in general. The rest of the endocrine glands can not maintain the power of the tissues to oxidize sugar in the absence of the pancreas, and the hypo- or hyper-activity of other endocrine glands do not produce actual diabetes in the presence of a normal pancreas.

While the failure of the tissues to use sugar in the absence of the pancreas is the central and definitely established fact, there are probably other primary defects involved in the development of acidosis, lipemia, increased metabolism, lowered resistance to infections, etc. All the evidence points to the view that true diabetes mellitus is primarily the result of pancreatic deficiency (islets).

There is, at present, no evidence of any specific relations of the endocrine functions of the pancreas to the gonads, male or female, or to menstruation, pregnancy, and lactation. Absolute diabetes, induced after conception, leads to death of the fetus. Absolute diabetes

probably renders conception impossible. Partial diabetes under careful dietary control permits of normal sex life of women (menstruation, normal pregnancy, normal child, lactation), and pregnancy under such conditions does not aggravate the diabetes. But in the absence of such dietary control pregnancy aggravates the diabetes, and uncontrolled diabetes in the mother is extremely injurious to the fetus. There is some evidence that in late pregnancy the fetal pancreas may function for the mother.

Influence of the Adrenals Upon the Genital System. As regards this influence S. Vincent remarks that what we call the adrenal represents the association of two elements, each of which is derived from a separate and independent system. The adrenal proper is part of the "cortical" or "interrenal" system. The medulla is simply an accumulation of chromaphil cells of the same nature as similar masses in other parts of the body. There is no clear evidence that these systems are functionally related.

The *medulla* (as well as the chromaphil tissue generally) is developed from the sympathetic. Its duty seems to be to facilitate the functions of this system in certain physiologic emergencies. The *cortex* (as well as the "accessory cortical adrenals") is developed from the germ epithelium, and the evidence is now strongly in favor of the view that it has certain important functions in connection with the development and growth of the sex organs.

There is a considerable amount of clinical evidence that tumors of the cortex are frequently associated with sex abnormalities. Also that when cortical tumors occur in the female, an accentuation of male secondary sexual characteristics develops.

Experimental Aspect of the Relation of Ovary to Uterus and Mamma. Emphasis is laid by L. Loeb on the following conclusions:

1. The ovary is a complex gland of which the most important constituents are follicles in various stages of growth and atresia, and corpora lutea. In addition we find in some species interstitial glands and sometimes embryonic structures developing parthenogenetically

from eggs. 2. Cyclic changes occur both in the ovary and secondarily in the uterus and the mamma. 3. The primary cyclic changes in the ovary are: follicle ripening, ovulation, corpus luteum formation. In some species ovulation is accompanied by degeneration of all but the smallest follicles. 4. An elaborate self-regulating mechanism controls evolution. Normally the corpus luteum inhibits ovulation. During pregnancy the life of the corpus luteum is prolonged. Experimentally ovulation can be accelerated by excising all corpora lutea, or retarded by producing artificial deciduomata. The retarding action is chemical, not mechanical. 5. The corpus luteum has a sensitizing action upon the uterus. If the uterus is incised or mechanically stimulated when the corpus luteum is elaborating this growth substance, maternal placenta (deciduoma) is formed. The mechanical stimuli, therefore, assume in this respect the function which the ovum exerts under normal conditions. The form of growth response of each species is characteristic. The localization of sensitization varies, being limited to the uterus in rabbits and guineapigs, but distributed more widely in the human. No specificity exists in the sensitizing substance given off by the corpus luteum as far as different individuals of the same species are concerned. The life of experimental deciduomata is short except in pregnancy, when their persistence is prolonged. 6. Corresponding to and dependent upon the ovarian changes, uterine cyclic changes occur—heat, growth associated with glandular activity, regression and interval. Heat probably is due to maturation of the follicles and dependent upon the absence of the corpora lutea; growth activity is the result of corpus luteum secretion; regression marks the cessation of this secretion, which is followed in the interval by a condition of rest. Pregnancy causing a persistence of the corpus luteum is characterized by an accentuation, but not a prolongation, of the active phase, and an inhibition of the uterine cyclic changes throughout gestation. 7. While it is possible to produce, experimentally, during pregnancy a new ovarian cycle, through excision of the corpora lutea, such a new cycle is not followed by a new uterine cycle. During pregnancy a mechanism is at

work preventing the uterine mucosa from responding to the stimuli given off by various ovarian structures. 8. It follows from 4 and 5 and 6 that the corpus luteum subserves at least two functions, inhibiting ovulation and producing a substance which causes growth in the uterus. 9. The ovary shows other non-cyclic functions. It has a trophic influence on the genitals and either primarily or secondarily determines the development of secondary sex characters. 10. The ovary, likewise, controls the development of the mamma. It exerts a trophic influence on this organ and determines its normal cycle. During heat and subsequent to ovulation proliferative changes occur; these cease while the corpus luteum develops and functionates. 11. The incidence of breast cancer in mice is greatly reduced by castration."

Transplantation and Retention of Ovarian Tissue After Hysterectomy. W. P. Graves is of the opinion that specific surgical menopause symptoms consist chiefly of vasomotor disturbances in the form of hot flushes. Theoretically, vasomotor changes of the artificial menopause are due to a break in the utero-ovarian functional harmony, by which the physiologic balance of the glands of internal secretion is upset. After extirpation of the uterus, vasomotor disturbances ensue with approximately equal frequency, whether the ovaries be retained, or ablated.

Retention of ovarian tissue after hysterectomy is of little or no value and may do serious harm.

[I would not concur without further evidence that retention of ovarian tissue if normal would be of no value after hysterectomy, or that it might do harm.—E. C. D.]

NERVOUS SYMPTOMS.

Gynecologic Origin of Nervous Manifestations. These are extremely common, according to W. F. Shallenberger.⁶ The question arises, are we dealing with a pure functional neurosis, an organic nervous disorder, or is the nervousness more or less the outgrowth of the gynecologic condition? The proper management of the case

depends upon this determination. Pelvic symptoms are frequent in patients with functional neuroses and the women becoming consciously aware of functions that are normally only sensed by the subconsciousness, may imagine they are the victims of all sorts of "female troubles." Such patients are not gynecologic and their attention should be led away from the pelvis.

On the other hand, it is frequently very difficult to determine, with absolute assurance, that the pelvis is perfectly clear. Adhesions, which are a common source of pain and discomfort, are often not to be made out. A careful history and a thorough study will be helpful. The assistance of a neurologist may be necessary. The possibility of an organic lesion must always be kept in mind.

If operation or gynecologic treatment is decided upon, careful attention to, and correction of, every condition that may be a factor is important. Thorough reconstructive treatment following operation is highly important.

[This subject often defies analysis. If in doubt whether the case is gynecologic, it is wise to treat it tentatively as a medical case.—E. C. D.]

ANESTHESIA.

Vaginal and Vaginopelvic Operations Under Local Anesthesia. Local anesthesia may be applied in surgery of the vagina and adjacent structures with such satisfaction to the surgeon and safety and solace to the patient, it would seem that the practice followed by our leaders in surgical thought does not work out entirely to the best interests of the patient. R. E. Farr's⁷ experience in this work has been so satisfactory and the procedure offers so many advantages over the ordinary method, that he cannot avoid the conviction the failure of surgeons generally, to use local rather than general anesthesia in this work must be due, more or less, to lack of familiarity with the application of novocain, and the immense satisfaction from its use.

Farr concludes that a large percentage of vaginal and vaginopelvic work may be accomplished under local anesthesia more safely and with greater comfort than with general anesthesia. With a standardized technic and proper equipment the demand for general anesthesia in these cases should decrease more rapidly in the future, and local anesthesia come into its own.

[Thoroughness of diagnosis, which should be made by palpation and confirmed examinations before any gynecologic operation would speak for general anesthesia. Thoroughness of operative technique also is increased by general anesthesia. Why not use general anesthesia unless it is contraindicated by heart-kidney-or other lesions?—E. C. D.]

Stovaine Intraspinally Combined With Twilight Sleep in Gynecology. F. L. Provis⁸ contributes his experience in 100 cases, comprising practically every operation. He sets forth the advantages and disadvantages as follows:

Advantages:

Practical absence of vomiting.

Patient can take nourishment almost immediately after operation from which follows a more rapid convalescence.

Diminished distension following operation.

Absence of dread of having an anesthetic as ordinarily understood by the patient.

Diminished liability to ventral hernia owing to absence of straining.

Absence of all abdominal movements. Complete relaxation. Diminished length of abdominal incision. The last three factors tend materially to diminish the duration of the operation and to render the same easier.

Disadvantages:

Toxic Vomiting. This sometimes occurs some 15 to 20 minutes after injection. As a rule it passes off in a few minutes, being quickly relieved by a drink of water.

Vaso-motor Dilatation of the Splanchnic Vessels. The pallor is most striking, and may appear very alarming, especially if the pulse becomes weak and of poor volume. The condition, however, appears more alarming than it

really is. The Trendelenburg position as a rule successfully rectifies it.

Headache. This is an undoubted disadvantage; its not infrequent occurrence cannot be denied, and in a few cases is serious. The pain is usually in the occipital region and nape of the neck, and as a rule is not severe. Patients subject to headache should not be given stovaine. To obviate its occurrence the foot of the bed should be raised on blocks for 36 or 48 hours, and when it occurs it is usually successfully relieved by aspirin, bromide, etc.

Retention of Urine is certainly not more common after stovaine than after a general anesthetic; if anything, it is less.

Albuminuria. The urine frequently contains a trace of albumin 24 hours after operation, but this rapidly clears up. This also very frequently occurs after a general anesthetic.

Trophic Ulcers Over Sacrococcygeal Area. Provis has seen these, but did not meet with any in his own cases.

[The advantages are not convincing nor significant. The disadvantages should be supplemented by others, notably an unjustified mortality.—E. C. D.]

OPERATIVE TECHNIQUE.

The Gynecologic History. G. G. Ward, Jr.⁹ emphasizes his plea for more care in history-taking by emphasizing the facts:

The more puzzling the diagnosis, the more important the history. A correct diagnosis depends not only upon a "*tactus eruditus*," but also on an accurate history. A thorough history will make much easier the formation of correct conclusions. If more complete histories are taken there will be fewer unnecessary operations. Time is essential to insure care and thoroughness.

The biggest word in the modern business world is "*efficiency*." The same applies to the professional world. The chief sign of inefficiency is the dread of working overtime. Efficiency means time saving. Many

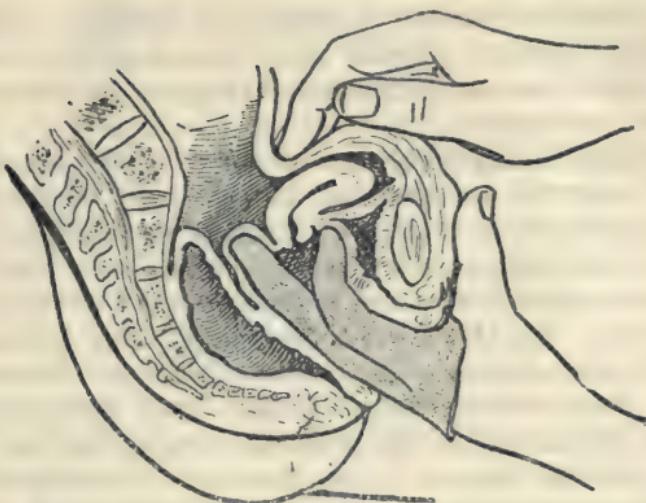


Fig. 2. Use of two hands for exploration of the uterus. The index and middle fingers protected by a cot are placed each in a cul-de-sac. The hand on the abdomen depresses the wall and is held in front of the fingers in the vagina (Sosnowska).

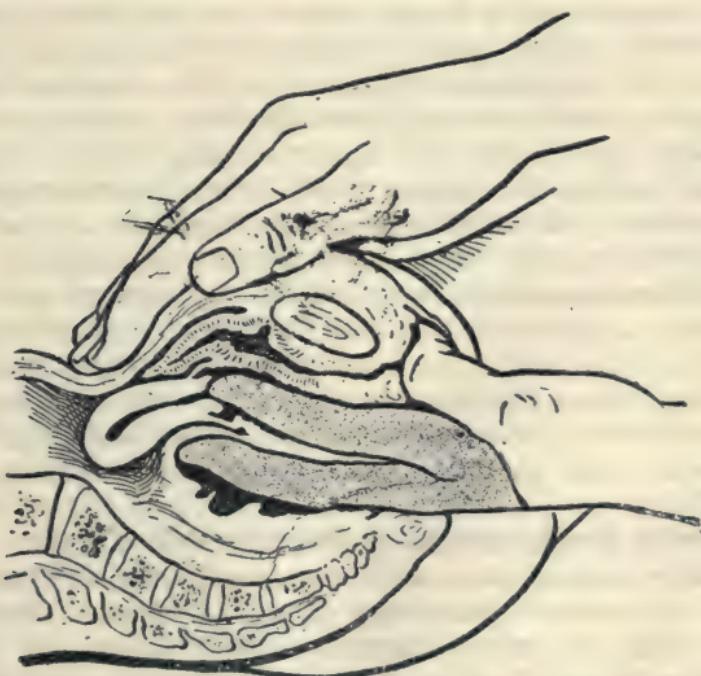


Fig. 3. Abdomino-recto-vaginal touch. With one hand on abdomen, the middle finger of other hand is introduced into the rectum and the index in the vagina. This last exploration completes the abdominal palpation and simple vaginal touch. The thumb is flexed where it comes in contact with the urethra (Sosnowska).

who say they haven't time would no doubt be surprised should they make a careful study, as does the business man, to find that they are not living up to their possibilities by one-half.

Gynecologic Exploration. Among other "technical details" referred to by Mme. H. Sosnowska¹ she recommends examination with two fingers if possible, allowing more extensive and precise sensations. The examiner's foot should rest on a stool, his elbow supported on the knee. By this means the fingers may by pushing the perineum strongly be pressed high up toward the pelvis. The rectum and bladder have been emptied. In rectovaginal touch, the index is inserted in the vagina and the middle finger in the rectum, this method completes the examination through the vagina, it should never be neglected.

Combined Rectovaginal Examination. F. L. Adair² states this method is especially valuable to physicians with short fingers, because one can reach higher with the longer middle finger, and it is possible to push the perineum higher, as it lies between the first two fingers. It is not especially difficult for the examiner and if properly used not very uncomfortable. It is a valuable method, as anyone will be convinced after comparing their findings on vaginal with those on rectovaginal examination. It should be used almost as a routine in gynecologic cases which need pelvic examinations.

[When possible the thumb in the rectum and finger in the vagina should push the organs up within easy reach of the palpating hand above the pubes, instead of letting the palpating hand crowd the organs down towards the pelvic outlet. This gives less pain to the patient, and more information to the examiner.—E. C. D.]

Rectal Examinations in Obscure Pelvic Pain. Pelvic disease causing pain and semi-invalidism, is frequently due to rectal pathology that is never diagnosed. The cause in many cases is easily discovered, but in others no satisfactory etiology is found. On this account a careful rectal examination should never be

(1) Presse Méd., Aug. 30, 1917.

(2) Med. and Surg., August, 1917.

omitted as part of the physical examination whether there be pelvic pain or not. D. H. Murray³ has seen many cases where such examination has made plain the cause of pain in the lower abdomen and pelvis. Rectal or pelvic pain may be the deciding symptom that brings the patient to believe they are in need of attention.

The rectum is so intimately connected with the pelvic and abdominal organs, through the sympathetic nerve, that it is not safe to ignore it in the examination of any chronic case. Every medical man should have some experience in rectal pathology if he expects to give the results in either treatment or diagnosis his patients have a right to expect. A good working knowledge of the fundamentals of proctology is of greater practical importance than much superficial knowledge of major operative work on any other part of the body.

Value of Vaginal Aspiration in Differential Diagnosis. In 6 instances H. Henderson⁴ found aspiration of a pelvic swelling was of great value in distinguishing between pyosalpinx and extrauterine pregnancy. He believes it is impossible to differentiate these clinically; on the other hand, they may be both present. Should there be a mistake in diagnosis, abdominal section in the presence of pus is dangerous as well as unnecessarily radical. Abdominal aspiration is unsafe, though vaginal aspiration is relatively harmless, and if carried out during the routine examination under ether does not unduly prolong the operation. While blood in the pelvis does not always indicate ectopic pregnancy, still given such finding, laparotomy is justifiable.

[This procedure would be dangerous except in the hands of a decided expert, but a decided expert ordinarily would not need it.—E. C. D.]

The Relations of Gynecology to General Surgery are considered by H. W. Longyear.⁵ At the Harper Hospital (Detroit) in 1897, some 709 operations, of which 360 were abdominal sections, were performed. Of the sections, 304 were made by gynecologists and 56 by general surgeons—about 84% and 16%. The same statistics for the year ending Dec. 31, 1916, are:

(3) New York State Jour. of Med., October, 1917.

(4) Jour. Michigan State Med. Soc., 1917, p. 277.

(5) Jour. Amer. Med. Ass'n., Aug. 18, 1917.

OPERATIONS AT HARPER HOSPITAL IN 1916.

No. Per Cent.

Surgical operations by general surgeons and gynecologists	4,412	....
Abdominal sections.....	2,652	....
Made by gynecologists.....	384	14.5
Made by general surgeons.....	2,268	85.5

If this exhibit is a fair average of the general surgeon's work everywhere, he is now doing more abdominal work than all of his other work combined, so if the average continues to increase for the next 20 years as it has for the last two decades, it requires little calculation to figure the general surgeon out of everything but his abdominal work.

Longyear believes the gynecologist and abdominal surgeon, as a specialist, has passed the zenith of his activity, under present conditions; the future promises a still greater position than that in the past, but it must be attained by a broader education and through the medium of general surgery of the highest order. The general surgeon is doing most of the abdominal and pelvic work because he is a better general surgeon than the gynecologist. It is this broad understanding of surgical problems in general that begets confidence, and confidence begets patients, and patients beget patients!

Some Contraindications for Certain Gynecologic Operations. Since 1890, when J. Longsworth⁶ graduated, interventions have multiplied 20-fold. Even so, operations are not too numerous, but many of those performed are contraindicated. What is the explanation? 1. Difficulties and uncertainties in diagnosis. 2. Lack of confidence in the wonderful restorative powers of Nature and in the remedial measures other than surgical. 3. Existence of a certain class of "parasitic" surgeons. 4. Demands from people with imaginary or trivial ailments for operation.

(1) As examples we may cite abdominal section upon acute salpingitis mistaken for extrauterine pregnancy, and pregnancy mistaken for fibroid tumor. Our best diagnosticians occasionally make these mistakes and surgeons of less experience make them frequently.

(2) A considerable portion of our profession, the honest but overzealous surgeon whose greatest failing is his tendency to resort, prematurely, to his knife. Here, also, is the physician who, not having the confidence he should possess in non-surgical measures, too readily advises surgery. This class is responsible for numerous unnecessary operations, *e. g.*, oophorectomy, hysterectomy, etc.,—where time, and the use of other measures would render an operation unnecessary.

(3) A class of men whose governing passion is to operate for the greatest amount of money that can be obtained.

(4) In the main, hypochondriacal men and women with neurasthenia or hysteria. The major portion is made up of women. Her friends have been operated upon and she, too, must have an operation for some imaginary or trivial ailment. If she falls into the clutches of a parasitic surgeon, her desire will be gratified.

Medical gynecology has a vast field of usefulness too little cultivated. The physician, when in doubt, should endeavor to restore his patient by non-operative procedures. If these fail, intervention should be considered. The general practitioner's responsibility is great, for it usually devolves upon him to make the first examination, and if his diagnosis is faulty or incomplete, his advice will be wrong and his treatment a failure. Diagnosis is the foundation upon which treatment rests.

Problems in Abdominal Surgery. These are considered by T. J. Watkins:⁷

Prevention of postoperative shock. As a result of a visit to Crile's clinic, Watkins is committed to the use of gas-oxygen, with ether as needed in nearly all cases. Local anesthesia is valuable in some cases, teaches the operator much about the sensitiveness of the viscera and develops gentle surgery. Drop ether continues to be the safest general anesthetic for the inefficient anesthetist.

Rubber as a substitute for gauze. For prevention of adhesions, rubber is used almost to the exclusion of gauze. It is thicker than usually advised, about the

same as in heavy gloves, and in pieces 18 by 30 inches. This heavier fabric does not roll up in wads and the weight aids in keeping the intestines out of the way.

Is it better to sponge out blood from the cavity? It seems logical to conclude that fresh blood in the sterile abdomen is less apt to produce adhesions than the trauma from removal of it by sponging. The advantage of leaving fresh blood in anemic individuals is self-evident. This cannot safely be done without assurance of complete hemostasis.

Supravaginal hysterectomy. Unsatisfactory results occur too frequently after abdominal section for pelvic disease. This is at times due to leaving a crippled, functionless uterus. A uterus is often suspended that should be amputated at the cervix. It is an error to suspend a uterus that is not going to participate in reproduction. This is emphatically the case if the patient has painful, profuse menstruations, and persistent leukorrhea. Supravaginal hysterectomy is preferable when the local or general condition makes future pregnancies inadvisable.

Excision of both tubes should include excision of the uterus. The one operation is done as quickly and as easily as the other. Infected tubes are nearly always associated with a diseased uterus. To leave such a uterus frequently results in dysmenorrhea, menorrhagia, leukorrhea, and an added danger of exudate and adhesives. To remove the body with the tubes leaves a better covered wound and a stronger pelvic floor than when the tubes alone are excised.

Supravaginal hysterectomy is rapidly displacing myomectomy. Experience has shown that few pregnancies occur after myomectomy, that other fibroids often develop and require subsequent removal, and that menstrual disturbances are common.

There is no evidence that menstruation is an eliminative function or of any use except in its relation to reproduction. He has been unable to observe that preservation of menstruation prolongs the functional life of the ovary. Menstruation can be preserved by high amputation when necessary for sentimental reasons. The presence of a small part of the body of the

uterus attached to the cervix is certain in his experience to preserve menstruation, free from pain and generally scant in amount.

Supravaginal hysterectomy is usually preferable to plastic operation on the tubes to produce sterility for reasons given above.

Treatment of the cervical wound after supravaginal hysterectomy. Watkins presents a modified technique which he believes will prevent prolapse. The walls of the cervix are not sutured together. The cervical wound is closed by super-imposing the cut ends of the broad ligaments. This is accomplished mostly by purse-string sutures which invert the raw surfaces, as follows: A suture is passed through the posterior wall of the cervix, the ovarian ligament, the infundibulopelvic ligament, the round ligament, and the anterior wall of cervix. While the suture is tightened the raw surfaces are inverted. The same is done on the other side. One or two additional sutures may be necessary for complete closure and to bury raw surface. Additional sutures are used if necessary to take up any lax tissue and further to join together the broad ligaments. This method does not constrict the circulation in the cervical tissue, a common technical error. Raw surfaces are approximated which insure strong union and which should prevent prolapse. The raw surfaces are quickly and efficiently inverted.

A common neglect in abdominal pelvic surgery is failure to do needed plastic vaginal repair.

Certain Postulates in Pelvic Surgery. In his review of this subject, W. R. Davies⁸ observes that no one doubts that Emmet knew the anatomy of the pelvis, or belittles the methods he devised to serve in his time, but he labored under the fear of infection, and the lack of a soluble suture-material which he could bury with impunity; therefore he went as far as he dared and postulated his findings.

Davies advises a consideration of pelvic surgery from the standpoint of a return to the normal relations, not attempting to gain our ends by a complication of the existing pathology of the parts, and above all let us

consider the woman as being in the upright position with her pelvic viscera filling the pelvic cavity where the force of gravity sends them and not in some mysterious manner floating up into the abdomen to the extent of their relational tethers. One should not train his memory in the position assumed by the parts, with the patient supine or with the coccyx higher than the symphysis, so persistently shown by the illustrators.

Modern aseptic methods, with sterile soluble suture material, which can be buried with impunity, leaves no one the excuse for failure to see and carefully isolate the structures which he hopes to repair in the pelvic floor, and which he can reapproximate *in situ*, without appealing to a compounding of the existing pathology to gain his ends.

Hemostasis of the Pelvis. A stereo-radiographic study was made by H. D. Furniss and W. H. Meyer⁹ to show: The degree of anemia that could be produced by the ligation of certain vessels or groups of vessels. The most effective methods of producing anemia for operations. The minimal amount of blood supply compatible with adequate tissue nutrition.

They found with ligation of the common iliacs and the ovarian arteries, the only vessel filled in the pelvis is the superior hemorrhoidal branch of the mesenteric. Release of the ligature on the external iliac makes little or no difference in the filling of the pelvic vessels. The internal iliacs can be filled through only one ovarian, and the ovarian through only one internal iliac.

A most extensive and possibly dangerous ischemia would be produced by ligation of the ovarians and common iliacs, or almost as complete as ischemia by ligation of the ovarians and internal iliacs. Bleeding would be lessened by the ligation of one ovarian and both internal iliacs, or both ovarians and one internal iliac, without seriously endangering the nutrition of the pelvis, provided that structures through which the vessels crossed the midline were not removed. Possible ligation of the ovarian and both internal iliacs during a hysterectomy would leave an inadequate blood supply, and ligation

of the ovarian and the uterines would give good hemostasis and yet sufficient blood supply.

Modified Uterine and Viscera Forceps. In 1910 A. J. Schoenberg described a *rubber-covered uterine forceps*, and now¹ presents a modification. The posterior blade

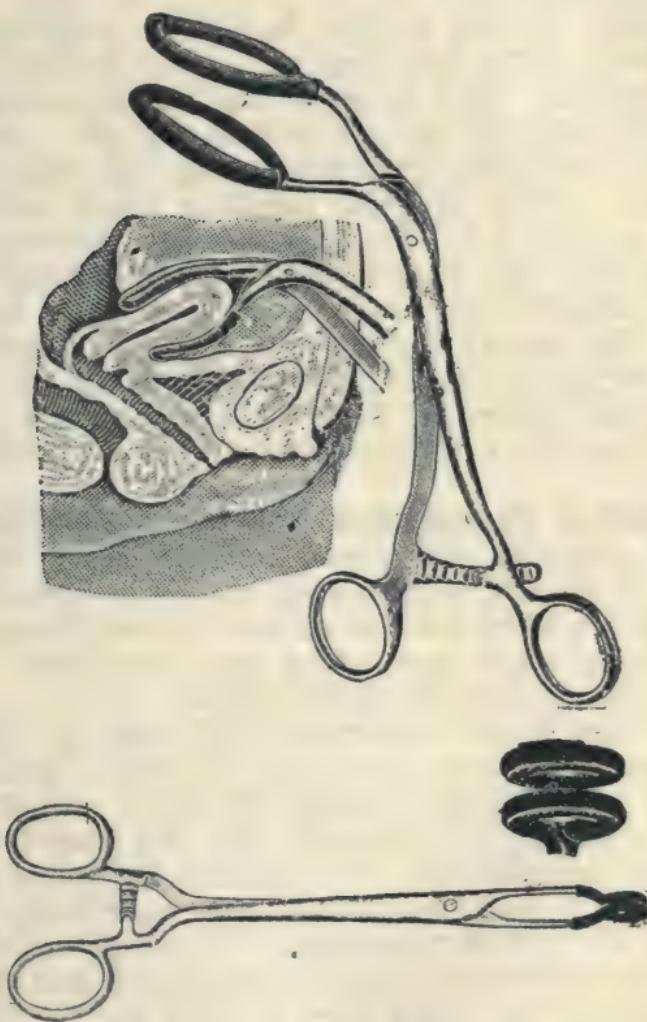


Fig. 4. (Above) modified uterine forceps.
Fig. 5. Improved viscera forceps (Schoenberg).

being slightly longer than the anterior, the shank of handle bent forward, permitting easier application to the uterus. The metal of the jaw has been widened, giv-

(1) Surg., Gynecol. and Obstet., February, 1918.

ing a better holding surface and the forward bend placing the ratchet and handle out of the way. The forceps are especially useful for holding the uterus when retro-displaced, facilitating any of the round ligament operations or other intrapelvic work. They hold firmly and do not traumatize.

The new *viscera forceps* have been made stronger. The metal of the jaws has been made slightly heavier and flattened. This increases the holding surface and prevents rolling of the covering on the jaw. The space between the blades from jaw to lock has been widened to 1 ctm., which prevents pinching tissue beyond the rubber-covered jaw. The steel has been so tempered it holds firmly but without compression. Rubber covering or catheter easily obtainable is used for both forceps. The viscera forceps can be used to handle the intestines, ligaments, or peritoneal folds, or any viscera with little danger of injuring tissues. They can be placed over the Fallopian tube without compressing the lumen.

Method of Dealing With the Divided Ureters. Although probably the gynecologist is most often concerned in dealing with divided ureters, the general surgeon, too, is often confronted with problems concerning these ducts which have either been impossible of solution or have been imperfectly solved.

In a very large proportion of all cases in which the ureter is accidentally divided, or in which a small distal portion is deliberately excised during a radical operation for cancer, implantation into the bladder is successfully accomplished if a suitable technique be employed; and such procedures have no relation to the method W. B. Bell^{1a} describes. This concerns the fate of the ureters which cannot be implanted into the bladder, because they have been divided too far away or because there is a condition of ectopia vesicæ, or removal of the bladder is indicated in the treatment of neoplasms.

The details should, of course, be varied to suit the peculiarities of other lesions *e. g.* ectopia. Naturally in such a complicated method one only attains perfection after repeated attempts; and it is probable that in many

details further improvements will be effected. There are two, or possibly three, stages:

I. Laparotomy is performed through a central sub-umbilical incision. The anterior branch of the internal iliac is tied on either side. Next, a loop of the lower ileum, about 18 inches in length, with its mesentery is isolated, and an anastomosis made to carry on the function of the intestinal tract from which the loop has been excised. The apex of the isolated piece of bowel is now superficially attached to the fundus of the bladder, and the two ends of the loop are brought out through stab-wounds in the iliac region on either side and fixed in position. Bell does not go into all the obvious details which should be taken to avoid contamination. The incision in the parietes is then closed. The dressings over the open ends of the bowel should be changed frequently, as there is a good deal of discharge, especially from the distal end, for a few days. When the attachments at these orifices are quite firm, swabs are taken from the interior of bowel with precautions against superficial contamination. Subsequently the loop of bowel is washed out twice daily with a 1-30 solution of Milton fluid. Within ten days the bowel is sterile or practically so.

The irrigation is continued for a few days longer, at the end of which time, if all the cultures are negative, the next step is undertaken:

II. A self retaining catheter is first placed in bladder, and, after the abdomen has been reopened, the apex of the loop of bowel is detached from the bladder. The ureters in turn are divided at the pelvic brim and are implanted into the isolated loop in the manner described by Stiles. The whole pelvis is then cleared; the genitalia with the upper part of the vagina, the parametrial glands and connective tissue, together with a large diamond-shaped piece of the base of the bladder—the largest area of which is situated over the front of the cervix—are removed. The bladder is closed with two layers of continuous sutures. Owing to the fact the anterior divisions of the internal iliac arteries have been tied at the first operation and that the pelvic portions of the ureters are removed without dissection, the evacu-

ation of pelvis and repair of the bladder should not occupy a longer time than half an hour. The apex of the isolated loop of bowel in which the ureters have been implanted is now anastomosed with the fundus of the bladder. The self-retaining catheter should be utilized for a week to keep the bladder empty. The operation is completed by the closure of the abdominal wound and of the open ends of the isolated loop of intestine, unless it be judged advisable to keep one or both ends open for the purposes of lavage. In this case the openings are closed subsequently at a third operation.

The feature of this procedure is the important scientific fact that it is possible to sterilize a loop of isolated bowel in a few days. If advantage is taken of the opportunities this possibility offers, the surgery of neoplasms of the bladder, and of ectopia, will receive greater impetus, for there is no doubt that in respect of these conditions surgery has been hung up, more or less completely. How far can this loop of intestine replace the bladder? Bell thinks very well. There does not appear to be any absorption of deleterious substances; at least there was no evidence in his cases. Further, it was observed that when fluid was poured in through a catheter at one end of the isolated loop it was not evacuated at the other until a considerable quantity had been introduced; then the muscle of the bowel contracted and drove out the contained fluid like a fountain.

In some cases, in which excision of the bladder might be indicated, the urethra and neighboring bladder wall could be conserved, and the bowel used to replace the excised body of the bladder. In the absence of a functional urethra, as in ectopia, an opening in the bowel through the rectus muscle, after the manner of a gastrostomy opening, might give satisfactory results.

Remains of Hypogastric Artery Mistaken for Ureter. S. E. Tracy² in a radical operation for carcinoma, freed the ureter apparently, but soon discovered this was included in the ligature, and that the structure dissected out was the hypogastric artery. Soon after a similar case occurred.

Both hypogastric arteries were the size of a normal

ureter and there was no pulsation. In one, the obliterated artery tapered to a very fine band for about 2 cm. as it came off the internal iliac. These obliterated arteries had every appearance of ureters, but were a little higher and further out toward the side of pelvis. Since this accident, when a ureter is located below the division of the internal iliac, it is followed back beyond that point, as tracing it to the bladder does not prove it a ureter.

American Surgeons and Abdominal Hysterectomy. F. Jayle³ claims this method is not original with Wertheim, who did not carry it out till Nov. 16, 1898. While in 1895 E. Ries (Chicago) and J. G. Clark (Philadelphia) had already described it.

As regards the Trendelenburg position, Jayle showed (1902) that it was pictured by Rolando in the 13th century and by Scultetus in the 17th.

Factors of Safety in Abdominal Hysterectomy. These are enumerated by D. Guthrie.⁴ If Trendelenburg anesthesia is used, as a rule there is but a coil or two of intestine in the pelvis, and it is seldom necessary to use more than a small square of gauze to get excellent exposure. When we insert two fingers and lift the abdominal walls well up the inrushing air will cause any coil that has not gravitated out of the pelvis to slide up. When this method is compared with putting the patient to sleep in the dorsal position, making the incision, then calling for the Trendelenburg position, it is amazing to see the difference in the amount of gauze used. Trauma to the small intestine varies with the amount of packing necessary, and this is one of the safe factors in preventing shock in pelvic operations. Should the pelvis not be infected the gallbladder is explored by touch before packing is inserted. If stones are found the question as to whether or not they should be attended to depends upon the condition at the end of the pelvic operation. The appendix is always removed unless some critical state contraindicates.

In abdominal hysterectomy, Guthrie uses the clamp method, clamping and cutting first the broad ligaments

(3) Presse Méd., July 23, 1917.

(4) Pennsylvania Med. Jour., November, 1917.

containing the ovarian arteries on both sides, next the round ligament separately. Freeing the uterus the fold of peritoneum on the anterior surface is dissected off, the bladder pushed forward, then the uterine vessels isolated on both sides and cut between the clamps. The fear of the clamps producing venous thrombosis is unfounded. In cutting across the body of the cervix a



Fig. 6. The coils of small intestine are gravitated out of the pelvis when the patient is anesthetized in the Trendelenburg position (Guthrie).

conical incision favors coaptation of the cervical margins. It is most important to close up the cervix carefully, and bring back the anterior peritoneal fold sutured to the posterior peritoneum. In multiparæ with relaxed vaginal outlets he sutures the round ligaments across the cervical body to prevent prolapse of the cervix. Before closing abdomen the omentum is brought down into pelvis, completely covering the operative field, and all coils which have gravitated back in the pelvis. By so doing the liability for adhesions is lessened. A continuous stitch in the peritoneum and interrupted sutures of chromic gut in the muscle and fascia is safer than a continuous stitch. These sutures are not tied tightly.

In the past six years Guthrie performed 245 supravaginal hysterectomies, 46 panhysterectomies, and 82 vaginal hysterectomies. In the 245 supravaginal hysterectomies one death was due to acute obstruction. Among the 82 vaginal hysterectomies there were two deaths, from general peritonitis, and from pulmonary embolism. Of the 46 panhysterectomies there were two



Fig. 7. Compare the difference in the amount of small intestine when the patient is anesthetized in the dorsal position (Guthrie).

deaths, from pneumonia, and from ileus. Excluding the unavoidable death from embolism the operative mortality is less than 1 per cent.

(Since reading this paper he has performed 95 hysterectomies with two deaths.)

Advantages of Total Abdominal Hysterectomy, Principally in Pelvic Suppurations. For years past, total abdominal hysterectomy has been supplanted by the subtotal method. This is a mistake, so M. Rochard⁵ believes. He observes that first of all, the cervix left behind may become the seat of epithelioma later. Moreover, in serious pelvic suppurations the total method allows adequate drainage.

Rochard had modified the technique by dividing it

into two stages—subtotal abdominal hysterectomy, followed by immediate and secondary ablation of the cervix. This plan which he has pursued since 1908, by first removing the uterus and adnexa gives plenty of room, so the ensuing ablation of the cervix is easy and safe. Thus we find the vagina open as after a vaginal hysterectomy, through it can be passed a forceps with a very large drain and a strip of gauze. The abdominal wall is then closed in its entirety.

The objections raised are taken up and discussed: *Hemorrhage.* It has been claimed that mortal hemorrhage may ensue on account of the difficulty of hemostasis. It is evident that the leash of uterine vessels needs more care for ligation than tying the uterine artery alone in the subtotal operation. Also a pleat should be carefully made of the posterior cut surface of the vagina to check the slight bleeding entailed by its section, but this is easy. Moreover, for the first two days there will be a bloody discharge through the vagina, as the free drainage prevents accumulation of blood in the abdomen, but as a rule, with careful hemostasis hemorrhage need be no longer feared. *Wounds of ureters.* These are less frequent, for after the uterus and adnexa are removed, there is nothing left but the small stump of the cervix, which is clearly visible, and easy to isolate. Hence forceps may be applied close to the cervix and division made along their edge, which is more difficult when the body of the uterus is in the way. *Shock.* This is usually due to the length of the operation, the technique described should not take over 45 to 50 minutes, and often less time, hence shock is seldom in evidence. *Infection.* The drainage at the most dependent portion assures evacuation of pus, blood or other accumulations. It has been claimed that drainage through the abdomen is better on account of the aid from the intra-abdominal pressure, the effect of respiration and the sitting posture. All these factors act as well in the vaginal drainage. *Difficulty of the operation.* This is one of the principal reasons assigned for abandoning the total method, but by the two-stage plan, the operation is rapid, easy and at the command of any one.

End-Results. In the year ending Feb. 1, 1918, Rochard performed 122 laparotomies with 3 deaths. There were 68 hysterectomies (46 subtotal and 22 total) for salpingitis, fibroma or cancer of the ovary. Of the 22 total hysterectomies 8 were in one-stage (1 death) and 14 by the two-stage plan, no deaths. Since that date 7 more two-stage operations have been done, without mortality.

In conclusion, Rochard states he resorts to the plan mentioned if the cervix seems suspicious on palpation, whatever the accompanying uterine or adnexal affection, and in bilateral pelvic suppurations in which there is inoculation of the pelvis by discharge of pus, rupture of a tubal or ovarian abscess. Hence the procedure is indicated in the gravest cases, complicated as they always are by intestinal adhesions.

Conservative Surgery of the Fallopian Tubes. In his consideration of this subject, H. P. Jack⁶ states the patient should be (*A*) young—under 30 to 35. (*B*) One whose history is such as to make probability of gonorrhreal or other infection clear and, most important, that the history shall show the infection is not less than from 6 to 12 months old. If still older, other things being equal, it will be all the more favorable for plastic work on the tubes.

(*C*) Location of the lesion by physical examination under anesthesia, during which it should be carefully noted whether the stigmata of gonorrhea are present; whether other or puerperal infection has been present. As shown in the first by Bartholinitis and inflammation of Skene's ducts. The presence of red spots at the ducts of any of these glands is presumptive evidence of a past gonorrhea. And in the second, by the location of the lesion, gonorrhreal lesions being located almost invariably in the tube, the puerperal ones in the parametrium, the tubes if involved at all being affected only secondarily.

In Jack's cases the tube was split in all and mucosa united to serosa by a few fine gut or silk sutures and iodized gut left in the stump of the tube at the distal end. This is a simple procedure but, as one approaches

the uterine end, becomes increasingly difficult, until, by the greater number of operators, as resection or sacrifice of the tube within 1 or 2 inches of the uterus becomes necessary, total destruction of the tube is deemed the proper procedure. Probe-pointed scissors have proven of great service in these cases. The fine probe is easily inserted into the tubal stump to, and into, the sterile uterus. The tube is then split for the desired distance, the ends everted and fastened by stitches, finally being sewn to an ovary or the remnants of one.

Jack asserts that serious postoperative results do not follow conservative surgery of the tubes. Pregnancy is possible in a fairly large proportion of selected cases. Conservative and gentle preoperative treatment for months is necessary to convert a bad risk into a good one. The gentlest handling, most careful separation of adhesions and a well-ordered technique in dealing with the stump of tube remaining is a *sine qua non* of success.

[The contraindications to such conservative treatment of the tubes, though diagrammatically attractive, are two-fold: First, greatly increased mortality from the operation; second, postoperative adhesions which may occlude the ends of the tubes and render them useless.
—E. C. D.]

Closure of Abdominal Incision. The method described by C. G. Child, Jr.,⁷ has been in use since 1907, with almost perfect results. The essential feature is closure by nonabsorbable sutures fastened outside of the skin and subsequently withdrawn.

Peritoneum: Where the opening is small, it is closed with a pursestring of fine silk or linen. This introduces a minimum amount of suture material, and turns the raw edges of peritoneum outside of the abdominal cavity, preventing adhesions. Longer incisions are closed with a continuous suture of silver wire brought out through the skin or a buried one of fine kangaroo tendon. **Fascia:** Here a continuous mattress suture is used. The free ends are brought out through the skin, 1 inch from the angles of the wound, and fastened over a roll of gauze to the free ends of the subcuticular stitch in

the skin. *Fat*: When this is of extensive thickness, it is likewise brought together with a continuous suture, emerging at the angles of wound. *Skin*: A subcuticular suture brings the skin together. The free ends are brought out through the skin 1 inch from the angles of incision and on the opposite side from the ends of fascial stitch. A small roll of gauze is then laid over wound, the sutures given a final tightening, and fastened, skin ends to fascial ends. *Subsequent care*: On the second day the dressing is taken down and the roll of gauze cut in two so as to allow proper inspection of wound. This should be examined every day so any effusion or serum or clots may be detected early and liberated before pus forms. By this precaution wound infection will often be avoided. Not looking at the wound for nine or ten days, or until temperature and pulse develops, is only too often responsible for cases of secondary union.

If infection should occur, the sutures are unfastened and the skin one withdrawn to allow free drainage. Where the infection extends under the fascia, the fascial suture is not removed, but the edges of the fascia are separated upon it to allow proper cleansing. Later, when the infection has subsided and union begun, traction on the free ends of the suture brings the fascia together. As this suture is not tied in the fascia, it does not slough out, but gives perfect control of the fascial flaps until removed. Thus, firm union of the fascia in infected cases as well as in clean cases becomes possible without resort to secondary suturing.

POSTOPERATIVE TECHNIQUE.

After-Care in Laparotomies. The plan pursued by him is outlined by H. W. Jones.⁸ In the routine care of uncomplicated cases, we encounter three great difficulties; thirst, nausea and vomiting, and gas pains.

If the patient wakes quickly and begins to vomit or show signs of restlessness, 1/6 grain of morphine is given hypodermically. If the patient sleeps out of her ether, this will not be necessary until later. Rectal

saline, one pint, is administered slowly before the patient comes out or immediately after. Water, either hot or cold, as best tolerated, is given as soon as the patient asks for it. If vomiting persists, after 12 hours, a dram of sodium bicarbonate in 6 oz. of lukewarm water is given. This usually results in washing out the stomach and the vomiting is ended. Only rarely does the stomach tube become necessary. When the soda is retained, it is useful in overcoming acidosis. In any case, bicarbonate of sodium, 20 grains every three hours is useful for the first two or three days. It not only overcomes acidosis, but seems to have a favorable influence on the gas pain. Chemically, this does not sound reasonable perhaps, but clinically it has proven satisfactory.

Many surgeons object to morphine. By relieving the pain, we not only put at rest the tissues which have been subject to trauma, but also conserve nervous energy, and thus shorten convalescence. In nearly every case, Jones orders morphine, 1/6 to 1/4 grain, hypodermically, every four hours, if occasion requires, for the first two days. In over 200 cases, it has never been necessary to use more than 1 1/2 grains. Some require none at all, the average getting altogether 1/2 or 3/4 grain. Codeine is a good sedative, but as an analgesic, is inferior. The old objection that paralytic ileus, or peritonitis might supervene, does not rule out anodynes for the first two days.

The patient is allowed to turn on her side as soon as she chooses. This often makes the expulsion of gas easier. But cathartics before the third day do more harm than good. After the third day the head may be raised, and she may have strychnine sulphate, 1/30 grain, *t. i. d.*, before meals. This stimulates the intestinal muscles, encouraging peristalsis, and braces the patient as well.

[Formerly many postoperative deaths were certified as acute septic peritonitis; now we know that a large proportion of these cases were acute dilatation of the stomach, and that are saved by the stomach-tube.

This is the most dramatic and the most significant topic under After-Care of Laparotomies, and the reader is referred to other literature on the subject.—E. C. D.]

Early Mobilization After Laparotomies. Observations on 1,500 cases are contributed by D. W. Tovey.⁹ He remarks that in planning an operation the one great object should be to bring about as early and complete restoration of health and working ability as possible. Our technique should be such as will assure the greatest safety, and the after-treatment that which will secure the greatest comfort and least risk of complications. This accomplished by simple preparations, the transverse incision, use of atropine and eserine salicylate on the table; with early mobilization, applicable to 95 per cent. of cases. Neurasthenic patients are not deprived of rest, but allowed to move about. He has never had an accident from early mobilization in ten years. Some operators have reported 1 per cent. of embolism. Phlebitis occurs usually between the 10th and 20th day. Mayo believes early rising prevents it. Most of Tovey's cases are home by that time.

The advantages of early mobilization are less nausea, vomiting and distention, earlier and spontaneous action of the bowels, less liability to circulatory changes, less weakening of muscles, better assimilation of food, early return to working ability, lessened expense. The only disadvantage is patients do not think much of an operation has been done.

Ileus Following Gynecologic Laparotomies. Details of a case in a patient of 48, operated on for pelvic adhesions and an obstructed sigmoid, are given by E. W. Pinkham.¹ From this and a survey of the literature he concludes the postoperative distress which is nearly always present is likely to be a source of danger, and not to be ignored. Differential diagnosis is not sufficiently important to demand even one hour of delay in therapeutics. The greatest source of danger in ileus is the vicious secretion of the upper small intestine caused by the failure of the glandular interaction and dehydration by vomiting. A strict prophylaxis includes pre-operative care as well as most careful attention to perfect technique at operation. Early treatment at the end of 24 hours is indicated, and early intervention if

(9) Amer. Jour. of Obstet., February, 1918.
(1) Ibid., April, 1918.

non-operative measures fail. The upper bowel should be drained, and not merely punctured, the radical cure being postponed till the general condition allows an extended operation.

Drainage After Curettage. G. S. Thompson² asserts this must be thorough, be maintained for an adequate time, and the principle of making the drainage at the most dependent part not be disregarded. The cervical tissues must be rendered soft or the operation commenced after preliminary use of a laminaria tent, or following the period. The cervical canal must then be dilated to the full Hegar size. If the curette be used, it must be gently. Application of iodized phenol makes little difference; if it is of benefit, it acts not by destroying germs but by determining blood to the part, and thus favoring the flow of serum. The uterus being wiped out, one of the tubes illustrated should be inserted to maintain the dilatation and be used for a few days or a week. A thiodine pessary is inserted in the vagina, and then a little gauze, and the patient put to bed; the top end of the bed is raised to facilitate drainage. As soon as the patient is able she gets up and remains up, so as to place the drainage at the most dependent part. If the tube tends to fall out, a small amount of iodoform gauze is placed at the top of the vagina. Every night for two or three weeks, when the patient goes to bed, a thiodine pessary is placed in vagina.



Fig. 8. Drainage tube for use after curettage (Thompson).

A, slot; B, retention ring; C, flange; D, opening for silk; E, interior tube.

The tube is about 2 inches long, slightly flanged at the vaginal end. At the upper third is a slit to allow escape of exudation, and about 3/8 inch from the end around the tube is a ring to prevent it coming out of the cervical canal. At the flanged end is a small aperture for a thread to allow easy extraction. Tubes have been made in five sizes, 3/16, 4/16, 5/16, 6/16, 7/16 of an inch. The smaller tubes could be used for drainage in leucorrhea without an operation after

preliminary dilatation by a laminaria tent. Many cases of whites can be cleared up or improved by such procedure if the drainage is maintained for a suitable time. We might call this operation drainage of the uterus. It is a valuable prophylactic against damage of ovaries and tubes and the necessity for their removal later. The tubes will also prove of value in maintaining dilatation for spasmodic dysmenorrhea.

[This abstract is introduced in order to call attention to the famous saying of Madame Roland: "Oh! Liberty what crimes are committed in thy name." We paraphrase: "Oh! Science," etc., etc.—E. C. D.]

Blood-Pressure in Postoperative Shock, Hemorrhage and Cardiac Dilatation. At the Long Island College Hospital, during the past 2 years, J. O. Polak and O. H. Heffter³ have been making observations upon the clinical importance of blood-pressure, pulse pressure, hemoglobin percentage, and leukocyte changes in postoperative shock and hemorrhage, and cardiac dilatation. An attempt to correlate the value of laboratory findings as an aid in making a differential diagnosis in shock.

They find there is a constant rise of 5 to 15 points in the hemoglobin readings following ether, when such anesthesia occupies more than 30 minutes. Consequently, allowance must be made for this rise in using hemoglobin estimations as a diagnostic sign in internal bleeding. The erythrocyte count is also increased but its variation is so slight it does not warrant any conclusions.

In the majority there is a moderate fall in both the systolic and diastolic pressure following ether. The blood-pressure returns to the pre-operative reading, in 12 to 48 hours. The inhalation of oxygen after the withdrawal of the ether diminishes this fall but is only transient.

In shock, especially where there has been much blood loss during operation, the fall in pressure is greater than after long operation without blood loss, dropping from 10 to 50 mm. The pulse pressure is a better index

of hemorrhage or cardiac failure than the systolic pressure.

There is a constant rise in the leukocyte count in hemorrhage, while the leukocytes fall in shock.

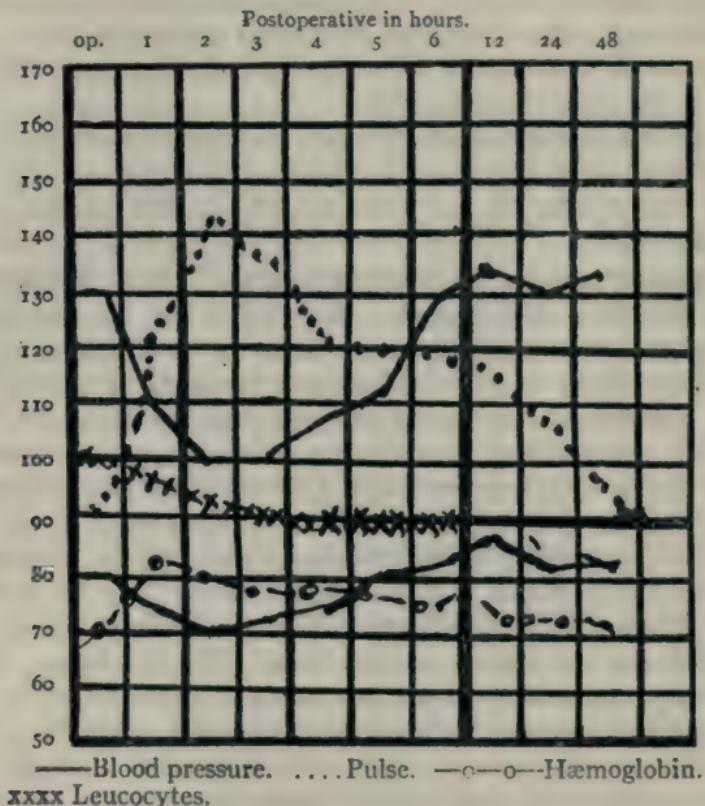


Fig. 9. Typical example of laboratory findings in shock (Polak and Heffter).

Treatment of Prolapse of the Structures Remaining After Hysterectomy. Failure to prevent a future hernia after a hysterectomy may be due, as a rule, to either faulty technique in the operative procedure, or to error in the selection of the type of operation.

Under the first heading W. T. Black⁴ includes failure to perform a high perineorrhaphy, a failure to implant the round and broad ligament stumps into the cervical

or vaginal margin. If a vaginal hysterectomy has been performed, the lack of suturing the stumps firmly into the vagina (Mayo).

The error in judgment would be to rely upon the usual technique, as carried out in a supravaginal and a panhysterectomy, where one has a hernia of all of the adjacent uterine structures, instead of performing a more radical abdominal fixation, or Mayo's vaginal hysterectomy.

In cases occurring as a sequence to a spinal or nerve lesion, or where the ligaments are very much atrophied and attenuated, nothing less than an abdominal fixation will prevent a future hernia. In that type who are long waisted and have broad hips, are constipated and toxic, where the entire muscular system is soft and flabby, there is general visceroptosis, with possibly a diastasis of the recti, the usual technique will not prevent further trouble. In this variety of procidentia, there is not only a giving way of the perineal segment, but the pelvic diaphragm has often been torn loose from its attachments, the round ligaments are atrophied and powerless, the broad ligaments, uterosacral as well as the structures anterior to the uterus, are found sagging, and the vagina has been detached from its attachments to the rami. There is no support from the perineal body, the pelvic diaphragm and organs are low in the vagina, intra-abdominal pressure is exerted in the wrong plane and a true hernia is present.

In the first and second degree prolapse the usual technique will usually suffice, *i. e.*, a perineoplasty, colpoplasty, amputation of the cervix if elongated, and the usual method of implanting the round and broad ligament stumps into the cervix or vagina. Where there is a moderate prolapse, but a relaxation of the anterior pubic and the posterior sacral segments, an abdominal fixation (Baldy) or some similar attachment, will be successful.

Where there is sufficient relaxation, the technique similar to performing an exo-hysteropexy (Kocher) is the most satisfactory, where one has removed the fundus and body, or done a complete removal. In this opera-

tion we secure a firmer fixation and avoid the dangers of a false ligament being formed, with its attendant dangers of obstruction. It may be advisable to resect a portion of the redundant vaginal wall before proceeding with the above operation. Colpocleisis in elderly women, or lessening the size by bands, rings, etc., in the vaginal wall, may be done with satisfactory results.

[End-to-end approximation of the broad ligaments as described by E. C. Dudley ("Principles and Practice of Gynecology," 1902, 3d Ed.) contains all the principles set forth in this article.—E. C. D.]

Prevention of Postoperative Retroflexion. H. C. Falk⁵ discussed the possible causes of retroflexion following the removal of pus tubes, showing that the increased weight of the uterus, stretching of the round and broad ligaments, with excision of the round ligament at its origin, all tended to assist a posterior displacement. The pus tubes when removed left a large raw area in the posterior cul-de-sac, sigmoid and the posterior surface of uterus. This could rarely be covered by the peritoneum. It cicatrized and when the connective tissue contracted the uterus, being large and having very lax ligaments, tended to be drawn to a posterior position. Cherry attempted to transplant omental fat but found in animals the fat was absorbed and replaced by dense connective tissue.

To prevent these various causes bringing about retroflexion different means had been adopted. They had had in the last 200 cases, 54 with large pus tubes. Of this number 27 had been followed. In 19 cases no definite procedure to prevent retroflexion was carried out; 7 of these had a posterior displacement. In 8 where a definite procedure was followed only one had a posterior displacement. They were led to believe some method of suspension or fixation should be used to prevent a post-operative retroflexion.

The Bladder After Operation. Speaking at the meeting of the American Gynecological Society, A. H. Curtis⁶ said postoperative catheter cystitis is really urinary tract infection caused by residual vesical urine. An

(5) Med. Record, March 28, 1918.

(6) Jour. Amer. Med. Ass'n., June 22, 1918.

essential feature has been the prevention of urine stagnation. In 465 consecutive operations the patients have been managed thus: All who complain of vesical distress are catheterized. Also, even when the power to void urine is present, catheterization is performed if residual urine is suspected. Furthermore, those patients who have required repeated catheterization are thereafter catheterized once daily immediately after urination, as long as residual urine is obtained. At the catheterization, 15 c.c. of 1/8 per cent. silver nitrate is instilled before the catheter is withdrawn. Medication consists of hexamethylenamin sufficient to maintain a positive formaldehyd test. In the presence of alkaline urine, acid sodium phosphate is added. Those who show idiosyncrasy to hexamethylenamin, or whose urine yields no formaldehyd, are treated with alkalies. In the presence of urinary tract infection, meats are permitted only twice a week. Seasonings of all sorts are forbidden, salt excepted. Sugar, sweets and pastry are limited. Under this plan, postoperative bladder troubles have disappeared. Retention is a factor of the utmost importance in pregnancy pyelitis. Obstetric patients should be tested for residual urine whenever carefully collected specimens reveal pus and bacteria. Through judicious catheterization, immediately after urination, these patients can often be saved from the danger of pyelitis.

J. A. Sampson opening the discussion stated that after a radical operation for carcinoma of the cervix, severe cystitis is a common complication. From interference with the blood supply and with bladder function. Some of these patients, in whom there was incidentally a vesicovaginal fistula, were not troubled with cystitis, and possibly in these severe cases the formation of a fistula temporarily would obviate the cystitis. One of the most important ways of treating a severe cystitis is to establish free drainage and rest.

G. L. Hunner agreed that retention of urine is, perhaps, the chief factor, and this is most often due to post-operative overdistention. Interference with the circulation and trauma do not have an important bearing; but if patients are allowed to go on after operation with overdistention, we may get a partial paresis which may

last for days or weeks, creating a most favorable condition for infection.

[The prevention of cystitis after operation by catheterization is sound practice. The old idea that the catheter caused the cystitis is obsolete. It is caused usually by residual urine.

I would add that after each catheterization, the bladder be irrigated with saturated boric acid solution, of which an ounce should be retained.—E. C. D.]

PART II.

DISORDERS OF MENSTRUATION.

The Blood Lost During Menstruation. Textbooks place the mean total loss during a normal period at about 200 gm., *i.e.*, this figure represents a fair average between higher and lower figures. Lahille⁷ studied women in this regard in which he computes the amount of blood through the iron ash of the hemoglobin. Gauzier in 1897 found that 100 gm. hemoglobin contains 0.39 gm. iron. The amount in the blood varies with the individual so this method is only an approximation. Lahille used 13.5 gm. as representing the amount of hemoglobin in 100 gm. female blood. If his method is trustworthy and the few women normal examples the figure 200 gm. must be ridiculously high, for 80 gm. represents the loss of blood by women who flow most freely—just short of menorrhagia—while from 50 to 65 gm. average the loss. A fourth of the women should lose not over 20 gm. at a normal menstruation. Generally speaking the days of the greatest loss are the second and third.

Influence of Menstruation on Acidosis in Diabetes. Menstruation has not been regarded as a factor which influences the course of diabetes mellitus appreciably. Naunyn quotes Lecorché as claiming it has a tendency to diminish glycosuria. Naunyn's own experience evidently points in exactly the opposite direction. G. A. Harrop, Jr., and H. O. Mosenthal^{7a} have not been able to find any allusions to the effect that menstruation may have on acidosis. In a colored patient, aged 18, during the period the glycosuria and the quantity of nitrogen in the urine were both much increased. These phenomena have often been noted in so-called cases of

(7) Ann. de Gynéc. et de l'Obst., 1917, p. 535.
(7a) J. Hopkins Hosp. Bull., July, 1918.

"acute" diabetes. When menstruation had ceased, it was apparent some permanent damage to the carbohydrate metabolism had occurred. The amounts of glucose excreted were somewhat higher than before, and the acidosis, as indicated by the acetonuria and the quantity of ammonia in the urine, was distinctly more pronounced.

Letters received from the patient's physician would seem to show that during the two weeks after she left the hospital (Nov. 11) her condition was thought to be unchanged. She was permitted to be up and about and there was presumably very little restriction of diet. On Nov. 25 menstruation began. She was very drowsy and nauseated. Deep coma came on during the day, and on the following day several general convulsions occurred. Death came about 36 hours after the onset of coma, and on the third day following the beginning of menstrual period.

In this case it seems justified to conclude that the menstruation was accompanied by increased acidosis. The symptoms became more marked with each successive period until fatal coma occurred. This is not common, but may possibly be regarded as an indication that diabetes patients should be closely observed during the menstrual period.

Erodium as a Uterine Hemostatic. Owing to the scarcity and high price of Hydrastis, J. A. van Dongen⁸ was led to use *Erodium cicutarium* as a substitute. He employed the liquid extract, and came to the conclusion that erodium should be placed between ergotine and hydrastis in its action on the uterus. In menorrhagia and metrorrhagia in virgins the result was good in 69 per cent., fair in 16, sufficient in 5, doubtful in 5, and absent in 5. In the hemorrhages of the menopause the result was good in 37.5 per cent., fair in 25, sufficient in 18 3/4, and negative in 18 3/4. In menorrhagia and metrorrhagia due to lesions of the tubes and ovaries the result was good in about 54 per cent., fair in 15, sufficient in 15, doubtful in 8, and negative in 8. In idiopathic hemorrhages a good result was got in 47 per cent., a fair one in 32, a sufficiency one in 5, and none

at all in 16 per cent. In most of the cases in which erodium failed the other styptics—ergotine, hydrastis, stypticin, and even curettage itself, had no better success; while erodium often led to a cure when other drugs had failed. In dysmenorrhea also van Dongen got encouraging results, especially when the pain was accompanied by a profuse flow and clots. Dysmenorrhea due to uterine displacements, fibroid tumors, and abortions was not relieved.

Experience With Corpus Luteum. The extract is found by H. E. Happel¹ to be the most effective remedy for menstrual irregularity in young women and for the nervous symptoms which usually accompany it. It is a specific in certain cases of headache and should be tried where the ordinary remedies fail. It prevents development of the symptoms of postoperative menopause and relieves those of the natural climacteric. It is useful in sterility and sexual anesthesia. Certain cases of dysmenorrhea are cured.

Thyroid in Uterine Hemorrhage. There is a type not caused by any discernable pelvic disease or pathology, nor related to any of the so-called hemorrhage states, but due to an alteration or lack of one or more of the hormones, which control the normal flow of blood from the uterus. This alteration is due to a deficiency in the secretion of the thyroid and such hemorrhage can therefore be controlled by a judicious exhibition of the dried thyroid.

O. C. Klass² would caution against the indiscriminate use of this substance. It must be used only when the diagnosis is assured, for bleeding may occur in hyperthyroidism, where much harm might be done.

Dysmenorrhea. During three years L. J. Weldon³ was able to study 109 cases in private and hospital practice. The displacements were found to exist with 38 per cent.; pelvic pathologic conditions with 31 per cent.; conditions pertaining to the structure of the uterus with about 11 per cent.; different forms of adhesions, cicatrical contractions, varicosities, cystic conditions, etc., with

(1) Interstate Med. Jour., July, 1917.

(2) Jour. Oklahoma State Med. Ass'n., April, 1918.

(3) Colorado Med., July, 1917.

about 11 per cent.; and mechanical obstructions including carcinomata and vaginal deformities with 9 per cent.

Menstruation is purely a physiologic process and any condition rendering the uterus incapable of efficient response to this normal impulse is directly responsible for dysmenorrhea. For convenience, then, we will say congestion is the medium; the difficulty arises, however, in finding the particular condition producing congestion. It is generally understood that what will produce congestion and dysmenorrhea in one patient will not in another.

Aimless treatment will accomplish nothing. Of the 109 cases Weldon operated on, practically all had had the uterine canal dilated and curetted from one to five times and in over 100 of these something definite was found in the pelvis as the unmistakable cause. Once in a great while, however, a dilatation relieves dysmenorrhea, when the canal is apparently normal. This procedure then accomplishes the desired result by breaking certain nerve fibers at the internal and external os and possibly by rupturing certain muscular fibers which contract too forcibly during menstruation. Nevertheless we should be ever on the lookout for other causes, lest we continue seriously to abuse this method.

If, after using every means at our command in history taking, physical examination, blood and urine tests, correction of erroneous habits, and rebuilding the general health, and having eliminated beyond a reasonable doubt the possibility of mechanical or inflammatory trouble in the uterine canal, we find that we can accomplish nothing; then no further time should be lost before going into the abdomen, for there the trouble will be found 99 times out of 100.

Use of the Silver Stem Pessary. J. H. Carstens⁴ claims this pessary can be introduced and retained for months and years without danger, as it is not only aseptic but also antiseptic. It will generally restore menstruation in obscure cases when all other remedies fail. It relieves nearly every case of dysmenorrhea due to abnormal conditions of the womb. If worn for six months to a year, it will cure many cases of sterility. A

careful diagnosis must be made of all pelvic troubles. Diseases of the tubes, ovaries, adhesions *must be rigidly excluded.*

[Few authorities of the scientific standing of Dr. Carstens would endorse this practice.—ED.]

Hemorrhage in the Non-Pregnant. The causes are divided by F. A. Pemberton⁵ into pelvic and extrapelvic. The latter is seen occasionally in the acute infectious diseases (especially influenza), nephritis, chronic passive congestion from cardiac disease, arteriosclerosis; though it is an unsolved question as to whether the high pressure or change in the uterine blood-vessels is the cause, and diseases of the blood, such as anemia, except chlorosis, in which the flow is diminished, myelogenous leukemia, and purpura. The flowing is rarely serious and amounts to little in the long run; but serious cases are seen. The pelvic causes are many; almost every gynecologic condition may show bleeding at some stage. Some may cause both menorrhagia and metrorrhagia, but most are confined to one or the other.

After the menopause, all bleeding should be looked on with the greatest suspicion. There are six main causes of it, the incidence of which in 95 successive cases, examined with and without ether, but with examination of the tissue removed, at the Free Hospital for Women, was;

Carcinoma of the cervix.....	33%*
Carcinoma of the fundus.....	12½%†
Erosion of the cervix.....	21%
Polyp of cervix and endometritis.....	11%
Fibroids	8%
Senile vaginitis	4%
 Making	 89%

* With an average age of 56 years.

† With an average age of 58 years.

The remaining 11 per cent. comprised cases of carcinoma of the cervix, prolapse, chronic endometritis, chronic nephritis, and a malignant cyst of the ovaries. Most of the carcinomas of the cervix were advanced and

diagnosed on inspection, nevertheless, this shows that carcinoma of the cervix is the most common cause at this time, and its preceding stage, erosion, is the next, comprising together, 54 per cent. Therefore, when a patient bleeds after the menopause, we may take it for granted there is an even chance that she has a preancerous condition of the cervix or cancer.

Packing of the vagina is resorted to when rest in bed does not control the bleeding. The main things to remember are to put either alcohol or iodine on the inner end of the gauze as an antiseptic, and to pack the vault of the vagina tightly, first back of the cervix, then on each side and the front, thereby raising the uterus and putting the broad ligaments on the stretch, which seems to decrease the blood supply. That it is effective is known to every surgeon who has pulled up on the cervix to stop bleeding during an operation on the uterus, or hysterectomy.

Ergot and hydrastis are useless, except in bleeding due to retained products of conception. Stypticin and calcium chloride are said to work sometimes, but are generally useless. Pituitrin is worth trying where no cause can be found, especially the young women.

Dilatation and curettage finds its greatest value in diagnosis. It is used as a cure when the cause is in the cervix or endometrium and not malignant, polyps, submucous fibroids, retained products. It removes the polypoid gland hypertrophy, but that may recur. Some young girls, with uterine insufficiency, get well if they are curetted at each catamenia for several successive months. This is more dangerous, however, than the *x-ray* or radium.

Abdominal operation is called on for the many causes found in the abdomen and for malignant conditions.

The two methods which render satisfactory the treatment of the uterine insufficiency cases, both in young and old, are radium and *x-ray*. They both act in the same way—by killing the follicles in the ovaries, and thereby stopping the internal secretion.

X-ray can be given in two ways, large or small doses as the urgency of the case requires, but requires large doses for 9 to 18 weeks to produce amenorrhea, while

one treatment of radium will do it. *X-ray* treatment is also much more expensive than radium on account of the apparatus used.

Hemorrhage of the Non-Pregnant Uterus. The following diseases will produce bleeding: Fibroids; carcinoma; sarcoma; chorioepithelioma; syphilitic or chronic metritis; chronic endometritis; senile endometritis. The diagnosis to determine the cause is made: by bimanual examination, by dilatation and curettage, and by intrauterine digital examination. Any or all of these procedures may be necessary to complete the diagnosis.

Here F. C. Hammond⁶ lays stress on the early diagnosis of cancer. He is still convinced that a curettage carried out as completely as possible, with subsequent examination by a competent pathologist, remains the best means of diagnosing carcinoma, even at the outset. In negative or doubtful curettage, combined with suspicious clinical symptoms, the latter alone must be relied upon as an indication for operation. Stress also must be laid upon the fact that we must cease to consider 45 to 50 as the so-called "cancer age."

Secondary uterine hemorrhages are due to diseases of the annexa, peritoneum, or parametrium. The tubal diseases to consider are hemato-, hydro- and pyosalpinx, which will form masses in the pelvis, causing pressure on the uterus, interfering with return circulation, and in this manner producing bleeding. These so-called secondary hemorrhages will continue until the tubal or tubovarian pathology is removed. Pelvic peritonitis may occasionally cause bleeding and diseases of the parametrium may do so very rarely.

Hemorrhage without any abnormal physical signs.—Under this heading too frequently one may group cases which in reality are mistakes that have been made in diagnosis. There are some, however, that legitimately belong under this heading, viz.:

"Excessive hemorrhages, whether menstrual or intermenstrual, due to violent emotion, fright, and sudden changes in temperature. They also may be brought on by indiscretion during the menstrual period, such as dancing, gymnastics, sexual excitement, or hard physical labor. It is not always

easy to ferret out the direct cause of these acute circulatory disturbances, but it is important to decide whether the hemorrhage is merely an excessive menstruation or the initial symptom of an inflammatory or malignant disease" (Clark).

Hemorrhagica myopathica metra.—Occasionally there is seen the patient who continues to bleed from the uterus after the removal of diseased tubes and ovaries. Hammond had a patient who returned to have a supravaginal hysterectomy done and promptly continued to bleed, and it was necessary to remove the cervix to control the bleeding.

Unsuspected syphilis.—He knows of 3 women presenting uterine bleeding, all had been subjected to several curettages, without any amelioration. The gynecologic findings were negative. A Wassermann in each instance showed the true cause.

Internal diseases.—If no local lesion can be detected and syphilis is excluded, the hemorrhage may be due to general conditions (extremely rare). E.g., typhoid, scarlet fever, grippe, acute rheumatism, malaria, smallpox, hemophilia, scorbutus, uncompensated cardiac lesions, diseases of the liver, emphysema, and general lowered vitality.

Surgical Treatment of Uterine Hemorrhage. P. Findley⁷ first considers that variety due to structural alterations in the pelvic organs. Too often surgery fails in this class for want of an exact diagnosis. The responsible lesion does not necessarily reside in the uterus, but may be in the appendages, or in structures adjacent to or remote from the uterus and its appendages.

Until recent years the endometrium was charged with the responsibility for a large proportion of hemorrhages. Now it is generally accepted that endometritis is responsible for but a limited number of cases. It follows that the curette has been largely superseded by non-surgical methods on the one hand, and by more radical surgical ones on the other hand.

In the absence of polyps, retained products of conception, and tumor formations in the endometrium, we must search more widely for the underlying causes.

Much has been written of late on changes in the

myometrium as factors in the causation of bleeding. These changes, whether of an increase in the connective tissue elements at the expense of the muscular, a decrease in the elastic tissue, or arteriosclerosis, cannot be permanently influenced by the curette, and may baffle all medical agents commonly employed. Such cases may well be treated with radium or the *x*-rays, but where no contradiction to surgery exists, the removal of part or all of the body of the uterus, will afford the most effective means of controlling bleeding, though there is ample justification for the choice of the *x*-ray or radium leaving to surgery the few cases which fail to respond to radiotherapy. Inasmuch as such cases commonly occur near the menopause, the dictum is clearly expressed that no case of so-called "climacteric hemorrhage" should be treated by radium or the *x*-rays without first doing an exploratory curettage to exclude cancer.

Bleeding fibroids demand surgery and should not be treated by radium, *x*-rays, or any other non-surgical procedure unless operative measures are contradicted by serious complications. Where the blood is below 40 per cent. Findley makes it his rule to precede the radical operation by curettage and rest in bed until the blood has been built up to a point of reasonable safety. Here again it is imperative to do curettage and examine the scrapings to rule out the possible existence of cancer in patients advanced in years.

Cancer of the uterus is a surgical lesion and demands early intervention. Radium and the *x*-rays have their place in inoperable and recurrent cancer, and as an adjunct to surgery, but in all operable cases there can be no justification for the substitution of surgery by radium or the *x*-rays.

What, if any, surgical measures should be employed in controlling the hemorrhages of puberty? *I.e.*, in which there is no demonstrable pathology. In such cases curettage should only be resorted to when general measures have failed, and unfortunately the curette will usually fail to control the bleeding. Calcium, thyroid extract, pituitrin, horse- or human serum, one and all may be tried, and if found wanting, curettage is next. Application of the deep, penetrating rays to the ovaries

will doubtless bring results in a proportion, but in so doing follicular atrophy may permanently do away with the menstrual periods and effectually sterilize the individual.

Clinical experience, as well as experimental observations, show the uterus may be essentially normal, and yet bleed excessively as a result of hyperfunctionating ovaries.

[The judicious use of radium for uterine hemorrhage as described by Kelly and others is highly commended.
—E. C. D.]

Radiotherapy in Uterine Hemorrhage. The following is a summary of J. A. Corscaden's⁸ views on radiotherapy in macroscopically normal uteri:

Radiant energy exerts a specific destructive effect on the Graafian follicle. Menstruation is dependent on and controlled by a corpus luteum formation. Destruction of the Graafian follicle must cause therefore an amenorrhea.

The majority of abnormal hemorrhages are due to disturbances in the menstrual mechanism and not to local mechanical causes, therefore these bleedings must cease in the same manner as normal menstruation, under radiotherapy.

Added to the effect on the corpus luteum, radium has a local cauterizing effect on the uterine cavity.

In women of the late child-bearing period radiotherapy is the procedure of choice. In girls it should be used as a late procedure.

The induction of the artificial menopause for economic reasons is possible. Whether it is justifiable or not is a matter for discussion.

The Pathologic Uterus at the Menopause. In a series of hysterectomies performed by C. R. Robins,⁹ 58 occurred in patients aged 40 or over, and in all of these the complete removal of the uterus and adnexa had been practised. In 28 the operation was performed for fibroids, pelvic inflammation and other conditions in which the impossibility of conserving the organs was manifest. In 30 cancer was either a positive or a pos-

{8} Amer. Jour. of Obstet., February, 1918.
(9) Amer. Jour. Med. Sci., March, 1918.

sible diagnosis. In 4 a positive diagnosis of cancer of the cervix, afterward confirmed by the microscope, was made and a Wertheim operation, preceded by the Percy cautery, was done. In 26 a diagnosis of chronic metritis, including in this induration of the cervix, was made and a possibility of malignancy considered. In practically all of these irregular or continuous bleeding was a prominent symptom, and sometimes accompanied by marked anemia. In 2 cancer of the fundus was found on opening up the uterus.

The symptoms associated with cancer are uncertain and irregular. A typical bleeding is most reliable. Rarely, there is no bleeding; but other diseases may also cause bleeding. The swollen cervix of chronic cervicitis may be quite difficult to differentiate from that of early cancer. Any pathology of the cervix is a "precancerous" condition. Biopsy is dangerous, as cancer cells may be scattered. Taking all of these into consideration Robins has made the following his basis of practice for some years:

In cases favorable for cure from operation it is not always possible to make an exact diagnosis. In our efforts to make our diagnosis exact we are liable to lose the advantage of an early operation by our efforts to secure tissue for examination, in this way disseminating cells and stimulating vicious growth. A pathologic uterus is potentially a malignant one, and even if cancer is not already present it may develop later. The line of safety requires that in those cases occurring about the menopause or after, where the symptoms and physical findings would suggest the possibility of malignancy, our procedure should be a total extirpation of the pelvic organs and the pathologic investigation made after the organs have been removed. In 26 such cases cancer was found in 2, (slightly less than 8%).

PART III.

THE OVARY.*

Growth of the Ovarian Follicle Under Normal and Pathologic Conditions. L. S. N. Walsh¹ finds the growth energy of the granulosa cells in the follicles of normal guinea pig ovaries varies with the size of the follicle, and follows a definite growth curve. The growth energy in small follicles is relatively low, then a gradual rise takes place with increase up to a maximum which is reached when the follicle attains medium size. This ascending curve is followed by a gradual fall in growth energy until in large follicles the proliferative power has fallen almost to the level of small follicles. Synchronously with maturity of the follicles there is an abrupt fall in growth energy to near zero.

There is a distinct localization of mitoses in the follicle. The large majority is found in the perioval part. With increase in the growth energy which characterizes medium follicles, there is an increase in the proliferative power of the cells more distal to—but still near the egg. We may therefore conclude that the egg exerts a stimulus, which causes proliferation of the granulosa cells.

Under pathologic conditions certain changes occur in the growth energy of the follicle: (a) Granulosa degeneration causes in the living cells a diminution in the proliferative power which is proportionate to the extent of degeneration. (b) Hypotypical follicles have approximately the same or only slightly diminished proliferative power as normal ones, and thus their failure to grow is essentially due to disintegration of the granulosa cells.

(*) Ovarian tumors are grouped with other tumors in Part VI. of this volume.

(1) Jour. Exper. Med., August, 1917.

Ovarian Organotherapy. In a preliminary report, W. P. Graves² states his personal experience with ovarian substance has revealed that preparations of the corpus luteum alone are less efficacious than those of the whole ovary.

Theoretical knowledge and scientific experimentation tend to show that an important part of the internal secretion is elaborated by the interstitial cells. It is probable the interstitial cells correspond to the lutein cells of the theca interna of the atretic follicle. In some animals these cells become disaggregated and appear as glandlike masses (interstitial gland); in others they remain confined to the follicle by the outside envelope (theca externa). The interstitial cells, therefore, correspond to the theca lutein cells of the corpus luteum. The interstitial cells of the ovary are analogous to the testicular interstitial cells which are known to elaborate an internal secretion.

Ovarian therapy, for its best effectiveness, should include at least the product of the interstitial cells. Preparations should, therefore, comprise the ovarian stroma, to take advantage of the atretic follicles. Preparations from the corpora lutea of pregnancy proved too toxic for practical use. Those from the ovaries of pregnant animals, with exclusion of the corpora lutea, proved superior to preparations of whole ovaries of nonpregnant animals that included the corpus luteum. The superiority of the follicular products of pregnancy is explained by the fact that follicle atresia is especially marked, and accompanied by increase in activity of the interstitial cells.

Effect of Hysterectomy on Ovarian Function. The uterus is not essential to a continuation of ovarian function, except as regards menstruation and reproduction. The disturbances of ovarian function attributed to hysterectomy, according to E. H. Richardson,³ are partly those associated with normal menstruation and partly from damage to the ovary through operative trauma or disease. Anatomic, experimental and clinical investiga-

(2) Jour. Amer. Med. Ass'n., Sept. 1, 1917.

(3) Ibid., June 22, 1918.

tions are overwhelmingly in favor of retention of sound ovaries both before and after the menopause age.

In the discussion H. A. Kelly observed that it is best to conserve the ovaries or as much of healthy structures as may be retained in patients under 40. In those of 40 or 42 it is best not to be so conservative. In the past we have decidedly overdone conservatism. If we can keep up menstruation, if only for a year or two, it is a great advantage.

W. W. Chipman said effort should be made to care for the circulation of the ovary that is left behind. If we can tell a woman after an operation her sexual organs are preserved, it is a great psychologic comfort. It goes without saying that when the ovaries are diseased they should be removed.

It is well not to enumerate the symptoms of the menopause to patients, but to give them ovarian substance or extract; when they know they are getting it, the psychologic condition will be kept up, which is so necessary in these cases, and there will be less operating. With a little treatment and good advice, H. T. Byford does not think we shall have to do quite so much surgery.

Fifteen Cases of Ovarian Transplantation. This series reported by W. D. Phillips⁴ were all of the autoplasic type, which seems most feasible from a practical standpoint. Resection of an ovary is often followed by hematoma, which produces symptoms almost as great as the primary condition. So much is this true that he has of late adhered to one or two methods of treatment—remove the ovary entirely, or puncture the small cysts and leave it alone. It is for those cases in which the destruction of ovarian tissue is so extensive as to require removal that transplantation is of value. Briefly, the indications are as follows:

(1) Tumors or disease in subjects under 40, where the object is the relief of pain and preservation of menstruation. (2) After loss of Fallopian tubes an attempt is made to maintain future possibilities of pregnancy. (3) After the removal of both ovaries an attempt to relieve patients of artificial menopause, or enable them to become pregnant.

The indications in the 15 cases were relief of pain and preservation of menstruation. A pocket was made just to the side of the median incision, in the adipose tissue, or under the rectus sheath. This site is preferable because of the ease with which the graft can be removed should it give trouble, also because of the abundant blood supply, and it is not so easily traumatized.

The immediate postoperative condition of these patients was somewhat alike, several complaining of symptoms of artificial menopause, such as hot and cold flashes; others of swelling and pain in the region of the graft. The symptoms gradually diminished and in 3 or 4 months menstruation appeared, the hot and cold flashes disappeared, and the patients, to all appearances, seemed normal. It was noticed that the congestion and swelling of the graft preceded the menstruation several days, and in some instances the graft was tender and painful. The absence of dysmenorrhea was particularly noticeable in those cases which had previously suffered pain.

The life of the transplant varies in individual cases. In one of these cases the graft was active and functioning 2 1/2 years after operation. Some observers have made similar observations 5 years after.

The advisability of transplanting ovarian tissue when hysterectomy was done has been much discussed, and the consensus of opinion is that ovulation without menstruation is useless.

In the 15 cases, 10 menstruated after the operation; 4 were not traced. One which did not menstruate had had the uterus removed. One case has stopped menstruating.

The use of iodine or heat on the graft to destroy infection in suppurative cases is hardly necessary.

Technique of Ovarian Grafting. W. B. Bell^{4a} insists that the grafts must be autoplastic, small in size, and from the interior—follicles, he pointed out, being essential, for the conservation of the uterine function. The operation was not indicated in women over 42, in those sexually inactive, or where conservation was at all possible. Grafts were stored in the utero-vesical pouch

until the later stages of the operation, and were then embedded either in the abdominal wound, the drainage wound, or in the fundus of uterus, according to the variety of case operated on.

[Irrespective of the technique, the question is on the value of the operation itself.—E. C. D.]

End-Results of the Conserved Ovary. From a study of 73 reoperations where one or both ovaries were conserved, J. O. Polak⁵ draws the following conclusions: 1. Routine conservation without due consideration of the ovarian and contiguous pathologic condition as it exists in the individual case, is not good teaching. 2. Regeneration of the conserved ovary depends largely on the type and duration of the existing infection and the condition of the tunica of the individual ovary. 3. Even when the most detailed technic is observed, the ovarian circulation is impaired. 4. The retained ovary, without the uterus, is always a focus for possible trouble. 5. The life history of the retained ovary is short, and the trophic influence of the diseased ovary has been overestimated. Finally, a cured patient has few nervous symptoms.

[Not enough is known on this subject to permit one to dogmatize in relation to it.—E. C. D.]

Pseudotuberculous Fatty Granulations on the Ovary. Some years ago F. Jayle called attention to this condition, and in a paper with Y. Bertrand⁶ gives details of another case. A patient, aged 35, was operated on for a chronic abscess of the ovary, the wall of the abscess contained small yellowish granulations, the size of a grain of millet. They were less prominent than the ordinary tuberculous granulations and much deeper yellow. Cultures from the pus gave many colonies of cocci in groups or chains and numerous colon bacilli. Histologic examination of the suspected granules showed they were made up of large cells stuffed with fat, staining deeply with Soudan III. In short they were lipoids, slightly different histologically and chemically from ordinary adipose tissue. Fat is often set free after necrosis of cellular elements such as the polynuclears.

(5) Jour. Amer. Med. Ass'n., June 22, 1918.
(6) Presse Méd., Aug. 9, 1917.

It is then taken up by the mononuclears (large macrophages). These large cells thus become true granular bodies, such as are frequently met with in degenerative lesions of the cord, and cerebral softening. They tend to arrange themselves about the vessels in the lymph spaces and constitute a perivascular fatty sheath. These granular bodies are to be found as well around certain plaques of atheroma; and in all tumors, principally where the tissue of the neoplasm has undergone marked degeneration.

Ovarian Abscess. At the Chicago Gynecological Society, L. E. Frankenthal⁷ reported the case of a patient who attempted abortion. He found a centrally located tumor reaching from the pubes to within three fingers' breadth of umbilicus, freely movable, pear-shaped; in position, shape, movability resembling a pregnant uterus. She had elevation in temperature and also increased leukocytosis. On bimanual examination it was felt certain this central mass was not the pregnant uterus but an inflammatory mass and that the uterus was behind and to the right. At operation an ovarian abscess was found adherent to the bowel, parietes, and bladder. At first he attempted to enucleate the ovary, but since in many places the adhesion between the bowel and the tumor wall was too intimate, he desisted, closed off the peritoneal cavity from above and around the tumor by sewing the parietal peritoneum to the mass. The skin was turned in all around and sewed on to the fascia. The abscess was then incised to the extent of 2 1/2 to 3 c.c., a perforated tube inserted, surrounded by gauze.

Frankenthal was asked if he believed the abscess was the result of infection. He answered, Yes. The infection in pregnancy is more likely to pass up along the ovarian ligament from the uterine cavity than to the tubes. Ovarian abscesses can usually be traced to an infection in a previous pregnancy, which is not the case with tubal abscesses. They usually are caused by gonorrhreal infection.

Hemorrhage Into Ovarian Cyst Simulating Ectopic Pregnancy. The most important ovarian conditions that may suggest ectopic pregnancy are: (1) a corpus

luteum or follicular cyst; (2) torsion of the pedicle of a cyst; (3) rupture of a cyst with or without intra-abdominal hemorrhage; (4) ovarian hemorrhage, and (5) hemorrhage into a cyst. Judging from the literature, the last is infrequent, especially with symptoms suggestive of ectopic pregnancy.

The patient seen by C. H. Waters⁸ was a secundipara, aged 28. The preoperative diagnosis lay between (1) hemorrhage into a corpus luteum; (2) a twist of the pedicle of an ovarian cyst; (3) tubal pregnancy unruptured, or (4) a tubal abortion. The clinical course and findings on examination favored the diagnosis of hemorrhage into a corpus luteum. A transverse incision revealed no free blood in peritoneal cavity. The uterus was not enlarged. The left ovary was transformed into a cyst the size of a small apple; no torsion of pedicle. The right contained a normal corpus luteum. Both tubes normal. Left ovariotomy, Willis operation for shortening the round ligaments, and appendectomy followed by dilatation of the cervix and curettage. The curettings were moderately abundant and showed complete regeneration of endometrium with slight glandular hyperplasia. Convalescence uneventful, and menstruation since has been normal.

Grossly, the left ovary was practically replaced by a tense, dark, thin-walled, unilocular cyst with bloody content. Microscopically, the wall consisted of fibrous and scanty stroma without definitely distinguishable epithelial lining. No lutein cells in evidence. In the basal portion of the wall, where more ovarian tissue was present, there were numerous petechial or interstitial hemorrhages.

Tubal and Ovarian Hemorrhage: Its Etiologic Relation to Pelvic Hematocele and Extra-Uterine Pregnancy. According to J. W. Bovée⁹ trauma plays a part in producing these hemorrhages. Hemorrhage from the tube may occur from general conditions that similarly affect other tissues. Venous stasis from circulatory disturbances or pressure from tumors may reasonably be included in a list of its causes. Ovarian hemorrhage may

(8) Jour. Amer. Med. Ass'n., Feb. 2, 1918.
(9) Ibid., June 22, 1918.

be confined within the ovary, constituting one or more hematomas, or it may take place into the peritoneal cavity, producing, if abundant, a hematocele. No other organ is so frequently the seat of hemorrhage as is the ovary. Stromal hemorrhage is commonly preceded by infection of the ovary. In but few cases have correct diagnoses been made before operation or necropsy. In the milder forms of the condition rest and anodynes may meet all indications. In the severer forms the same rules apply as in ectopic pregnancy.

PART IV.

DISPLACEMENTS AND INJURIES.

FLEXIONS AND VERSIONS.

Surgical Treatment of Displacements. The keynote is individualization, and B. F. Kuhn¹ believes the only way we can attain a good measure of success is to familiarize ourselves with a number of the standard procedures, and make a thorough study of each case to determine which operation is most certain to bring relief.

He also believes the uterosacral ligaments have not received the attention they deserve, and that the method of Jellett of Dublin (1911) seems to hold out a way of overcoming the usual technical difficulties. This consists in cutting completely around the cervix and pushing up the vaginal cuff so formed until the ligaments come into view. They are then grasped in forceps and severed at their uterine end. The posterior part of the incision is then closed. This leaves the ligaments protruding from each side and in the grasp of the forceps. The cervix may now be pushed back and the ligaments crossed over in front and firmly sutured to its anterior aspect, after which the cut in the mucosa is closed. He says this has proved of use when other methods have been insufficient and is especially applicable in primiparae.

[Shortening the utero-sacral ligament is correct as a mechanical, but has been disappointing in practice.—E. C. D.]

Non-Surgical Treatment of Retrodisplacements. While the cases suitable for this plan are necessarily limited, the results are so favorable as to make their study well worth while. E. E. Montgomery³ writes that

(1) Jour. Indiana State Med. Ass'n., March, 1918.

(3) Therapeutic Gaz., March 15, 1918.

the first consideration should be an accurate diagnosis of the character, degree and complications of the displacement.

When the latter is recognized our minds naturally turn to some mechanical means. In the use of a pessary the following dogmas should be fixed in mind:

1. It should be fitted and neither too large nor too small. By passing two fingers into the vagina, with them estimate for the length the distance between the promontory and the inner surface of symphysis. The distance the fingers can be separated will afford an idea of the proper width. The instrument should be molded to the proper curvature and nowhere make undue pressure.

2. The pessary should never be used until the organ has been properly replaced. The instrument does not support the uterus in the sense that it rests against its wall, but through traction on the posterior fornix it lifts up the cervix and consequently the fundus—the other end of the uterine lever—falls forward. If too short, it fails to exercise accurate support and the uterus falls back over it or the instrument turns in the canal, and the condition is reproduced.

3. The pessary should only be used in recent cases; where the uterus is heavy from subinvolution following labor; or the process of gestation is endangered.

4. It may be used with advantage in early pregnancy when the uterus falls back from its increased weight. Here the pessary maintains the uterus until it can rise above the brim of pelvis, when support is no longer required.

5. The pessary should always be regarded as a foreign body, and its wearer be subjected to repeated investigation to see it is producing no undue effect.

Formerly replacement was advised by use of an instrument, but it is difficult to prevent the introduction of the infection, which may result in worse conditions than displacement, or render it beyond correction. In the great majority careful bimanual manipulation will effect replacement. Where a large uterus is caught beneath the promontory the patient should assume the knee-chest position, the attendant retract the perineum, seize

the cervix with a tenaculum and then carry it backward, when, unless there are adhesions, the organ will fall forward and a pessary can be inserted before the patient changes position. The patient wearing a pessary should be requested to return within a week, but if impracticable she should be instructed how to remove it should she suffer discomfort.

Women with adherent uteri are not necessarily victims of the knife, especially when recent. Unless associated with suppurative conditions they can be relieved by pelvic massage.

For the young unmarried woman much may be done by hygienic measures. Her clothing should be loose and supported from the shoulders, giving free play to her abdominal muscles. She should be encouraged to take exercise, and household duties are beneficial associated with exercise in the open. Sitting in reclining chairs or upon her sacrum should be prohibited. Before retiring and upon arising she should be directed to assume the knee-chest position, and in this situation to practice deep inspiration and expiration. This pumps the blood out of the pelvis, promotes correction of position by allowing the intestines to get behind the uterus, and with the lessened abdominal pressure favors the decrease in weight of the organ. The bowels should be kept free, avoiding straining, and avoid overdistention of the bladder. Swimming is good exercise for such patients. It is astonishing what these systematic measures will do. Local treatment should be religiously avoided in the virgin.

[A sound article.—E. C. D.]

Choice of Operation for Retrodisplacement. Montgomery⁴ also discusses this topic, and states where the uterus is not prolapsed but only in retroversion or retroflexion the most satisfactory operation is a modification of the Gilliam operation.

This consists in opening the abdomen in a median line or by transverse incision through the skin, superficial fascia and aponeurosis, or by vertical incision in the midline through the peritoneum. Adhesions are broken

up, abnormal conditions of tubes and ovaries treated, and a ligature carried under the round ligament about 1 1/2 inches from the cornu of uterus; the ends of the first ligature introduced secured by a hemostat, and the ends of the second threaded into the eye of a modified Deschamps' needle. The round ligament is caught with a hemostat external to the point at which the ligature is passed beneath it where an incision is made in the anterior leaflet of the broad ligament and the needle threaded with both ends of the ligature carried out between the layers of the broad ligament until it reaches the point at which the peritoneum is reflected on the anterior abdominal wall, when it is brought through the aponeurosis and its ends secured with a hemostat which has been removed from the round ligament. The same is done on opposite side. Then holding the ligature tense, a closed scissors is passed along it through the aponeurosis, the blades slightly separated and withdrawn. Traction upon the ligaments usually brings through the loop without difficulty. Each loop is then secured on either side by a suture, which includes the distal and proximal portions of the loop and a portion of the aponeurosis. The loop can be drawn out or relaxed so as to permit the necessary traction upon uterus.

This procedure utilizes the best part of the ligament to hold the uterus forward, it creates no raw surfaces for subsequent adhesions, leaves the uterus moveable yet incapable of being displaced into the retrouterine pouch. It leaves the ligaments capable of evolution and involution and thus insures greater probability of maintaining the uterus in position in subsequent childbearing. It is applicable to the worst cases as well as to the simple ones. It will not, however, correct all conditions. Montgomery would not advocate it alone in retrodisplacement associated with prolapsus. Shortening of the ligaments in such cases means the uterus which is probably heavy will drag on its anchorage. Here it is important that the cervix should be drawn up and back, thus insuring the uterus to lie across the pelvis similar to a normal position of the organ. In all cases of prolapse the operation should be associated with other

operative procedures, such as restoration of the pelvic floor, and occasionally shortening of the uterosacral ligaments or by application of peritoneal folds.

In May, 1915, Montgomery reported 756 operations, over 90 per cent. combined with procedures for the correction of complications. The principal procedures were: Curettetment, 632; perineorrhaphy, 239; trachelorrhaphy, 175; amputation of cervix, 104; resection of ovary, 58; anterior colporrhaphy, 56. The mortality was 5 cases. The last 400 without a death.

Since then and up to April, 1917, he performed the operation in combination with other procedures 140 times. The operations with which this procedure has been combined have been curettment, 131; appendectomy, 110; amputation of cervix, 46; perineorrhaphy, 29; trachelorrhaphy, 26; resection of ovaries, 10; and temporary ventrosuspension in 10 cases. Various other operations as gastropexy, nephropexy, etc., were done in occasional cases. In this series 1 death occurred.

Operative Treatment of Fixed Backward Displacement. A. Smith⁵ has found the behavior of the uterus different after the separation of the adhesions. In some cases it came easily up to the abdominal wall, showing a certain amount of relaxation of its supports; in others, it did not come up so easily, and considerable force was necessary to draw it into position.

He divided his cases into two groups—(a) the uterus with relaxed supports, (b) with unrelaxed supports. The uterus with relaxed supports must be suspended or fixed. On freeing uteri with unrelaxed supports three types were met with—(1) where the uterus righted itself automatically, (2) where manual replacement was necessary, (3) where, owing to a thickened and shortened uterosacral ligament, the uterus could not be brought into normal anteflexion. Types (1) and (2) should neither be suspended nor fixed, as they have little tendency to fall back. With type (3) he freed the uterus from its entanglements, straightened out the tubes, released the ovaries, and left the case to Nature.

Operation for Retrodisplacement. This is a modification of the Alexander-Adams' method devised by H. W.

Sweetnam.⁶ A transverse incision is made at the pubic hair margin, from one superficial epigastric vein to the other, and carried down to the aponeurosis. These veins are constant, and form a good landmark as to the length of incision. They need never be divided. The subcutaneous fat is then cleared cleanly up off the aponeurosis. A vertical incision is now made in midline through the aponeurosis, up for 1 1/2 to 2 inches. The rectus fibers are separated with the handle of a scalpel. The peritoneum is picked up with forceps and an opening 1 to 1 1/2 inches made into abdomen. Through this the uterus can be inspected, and the tubes, ovaries and appendix be delivered. A pathologic condition of the adnexa can be dealt with, the incision being enlarged if necessary. The round ligaments are then shortened.

With the gloved finger and gauze the fat is stripped down and out, exposing cleanly the aponeurosis overlying the inguinal canals. The canals are then opened, a split in their roof an inch long being sufficient. The ligaments are always easier to find than when the usual Alexander-Adams' method is employed, owing to the better exposure. The ligaments are picked up with forceps, and their coverings stripped up towards their uterine attachments. The amount of shortening required is determined by a finger in the abdominal wound. If the ligaments are small they are pulled away from their external ring attachments without ligature. When large or their veins dilated they should first be doubly ligated with catgut and divided between. The ligaments are now lying cleared of their coverings in the canals, and attached only by their uterine ends. They are fixed in the shortened position as follows: The tip of the left index is hooked up slightly under the lower arched border of internal oblique, a Spencer Wells' forceps is then thrust through the aponeurosis and the internal oblique down on to the index finger, the forceps entering the aponeurosis 1/2 inch above and 1 inch internal to the internal ring. The free end of the ligament is caught up in the forceps and drawn through, care being taken not to include the ilio-inguinal nerve. The ligament is pulled taut, the uterine position again verified by a fin-

ger in abdomen and the ligament then fixed to the aponeurosis as it perforates it by two catgut stitches at right angles. This process is repeated on the other side and abdominal wound closed, both peritoneum and aponeurosis being sutured with continuous catgut stitches. The free ends of the ligaments are again taken up and tied together, only the first turn of a knot being made. A full knot is rather apt to leave a lump under the scar, which the patient at once detects. This half knot is made to lie centrally over the sutured aponeurotic line. In this position it is sutured down to the aponeurosis, thus giving a further hold to the ligaments. The redundant parts of the ligaments are now cut away close to the knot. The slits in the aponeurosis over the inguinal canals are closed with catgut, and the transverse wound brought together by a continuous catgut stitch for the fat in a deep and superficial layer, and horsehair for skin. A gauze and collodion dressing is applied. The uterus in all cases of retrodisplacement is first curetted.

The advantages claimed for this method over the ordinary operation are: There is no possibility of leaving behind in the pelvis an undetected pathologic condition. The exact position in which the uterus is placed can be determined both by sight and touch. It greatly lessens the contraindications to the Alexander principle of dealing with a retrodisplaced uterus. The uterine condition and a diseased appendix can be dealt with through the one incision, still preserving the Alexander principle of treating the displacement.

A Simple Operation for Retroversion. Some 3 years ago A. N. Bessesen⁷ worked out a method which so far has shown no relapses. He finds that E. C. Dudley described a somewhat similar plan (*Amer. Jour. Med. Sci.*, June, 1906):

"Traction being made on the ligament in order to locate its point of entrance at the internal ring, an ordinary needle is introduced at this point and the round ligament and the adjacent parts of the broad ligament are caught up from point to point until the suture finally is brought out in the uterine tissue near the uterine end of the round ligament. The tying of the suture, which should not be drawn too tightly, shortens

and strengthens the ligament by crumpling it on itself. If the ligament is absent or highly attenuated the structure of the broad ligament between the horn of the uterus and the internal ligament may be brought together by a similar suture with similar results. Before tying the suture the surfaces should be scarified in order to secure strong union."

In his modification of Dudley's operation Bessesen does not carry the suture to the horn of the uterus, but starts with the needle about 1/2 to 1 inch distal to the uterus, passing through the round ligament and then from point to point to its exit at the internal ring, there the needle is made to take a bite through the tissues at the ring, and is returned in like manner to the point of starting. The opposite side is treated in the same way. When the operator draws taut the suture of the one side and an assistant draws taut the suture of the opposite side it is easily determined how much tension will be required to bring the uterus into the corrected or, better, slightly over-corrected position. The sutures are then tied. If desired the uterosacral ligaments can also be shortened to give added security.

By this method we avoid the long strand of ligature that must be exposed when the suture is tied in the Dudley operation. If the two extremes are drawn into opposition we produce not so much a crumpling of the ligament as a bending or doubling of the ligament on itself, in a manner to form an irregular circle, thus practically eliminating the round ligament as a factor in the support of the uterus. The operation retains the strongest part of the ligament to functionate. The thinner outer part is crumpled on itself so it also is made thicker and of equal strength with the uterine end.

[Dudley now is inclined to substitute post-uterine shortening of the round ligaments (Webster-Baldy operation) for the one above described.—E. C. D.]

Backward Displacement. We have more than 100 variations of the operation for retrodisplacement, and to be able to select the proper procedure is often of more value to the patient than to be able perfectly to execute a technique that is not applicable to the condition found. However, T. O. Burger⁸ is impressed with

the fact that surgery alone is not always the proper method.

The pessary which is becoming obsolete may have a place in this condition, especially in this orthopedic or improper skeletal poise. It is of value in that it fills the space in the hollow of sacrum which holds the fundus; it also pushes up the uterosacrals, taking up their slack and in that way pulls the cervix back, making it easier for the fundus to tilt forward, thus allowing the intestines and intra-abdominal pressure to hold it forward. If the pessary is used temporarily during gymnastic exercises, along with a properly adjusted corset, and if it be subject to constant supervision, every effort being made to obtain a correct skeletal poise, we may get much benefit and later dispense with it altogether.

Our main object should be to secure and maintain normal anatomic relations of the pelvis and abdominal and pelvic contents.

Women who have congenital poor poise and bad placement of organs, also those who from lack of attention to their position have failed to develop a proper normal anatomic corset, *i. e.*, a good firm anterior wall, are the ones that have this condition. We must *reform* them and see they develop enough muscle tone and correct skeletal poise to prevent the ptosis and backache and neurasthenia that most of these women seek advice for. It requires a master effort not to operate and then let the other doctor have the patient back to do with as he may. It may be necessary to put such women to bed and in the Trendelenburg position at first to get the abdominal contents into upper abdomen and while in bed assist the development of good abdominal wall tone by proper exercises, also put on some fat which will help to deflect intra-abdominal pressure and form a shelf to support the abdominal contents. The knee-chest, or easier, swinging the body from the thighs in prone position, relaxing and expanding the upper abdomen and then contracting the lower abdominal wall to develop better tone and also push up the contents.

After rest and treatment in bed, when it is necessary, the patient should be properly and comfortably fitted with some mechanical supports, such as braces, binders

or scientifically adjusted corsets; she should be under constant supervision for a long period of time, faithfully instructed as to exercises and proper posture, emphasizing the importance of not stooping or slouching, thus preventing attitudinal strain.

PROLAPSE.

Prolapse of Uterus in a Child. In a colored girl, aged 13, seen by W. C. Pollock,⁹ the protrusion was of 5 years' standing and slowly increasing. The girl was in poor condition, with marked scoliosis and tilting of the pelvis, also bilateral genu valgum. The elongated cervix together with the vaginal walls were protruding from the vulva. There was atrophy of the levator ani. Uneventful recovery followed anterior colporrhaphy, perineorrhaphy by the Emmet method, obliteration of the cul-de-sac, and shortening of the round ligaments by Webster's plan.

The Cure of Prolapse. This being an abnormal condition, and in that sense a disease, must, so J. A. McGinn¹ believes, be treated as conservatively or ruthlessly as any other diseased organ.

On general principles no operation should be performed on the nulliparous woman in early life that would interfere with or complicate pregnancy or labor. On the other hand, conditions might be such that no such method would effect a cure. Under circumstances we would be justified in sacrificing her child-bearing function.

The same question arises in the multiparous woman in the child-bearing period, though the loss of function would likely not entail as great a sacrifice. This would rule out interposition operations, hysterectomy, all fixation operations, both vaginal and abdominal, unless artificial sterilization was performed at the same time. When it is decided to maintain child-bearing function a choice can be made from: Replacement of bladder by the Goffe method, restoration of the perineum with vaginal operations on the round ligaments by the method of

(9) Med. and Surg., April, 1917.
(1) Amer. Jour. Med. Sci., November, 1917.

Goffe, Vineberg, Wertheim, etc., or abdominal shortening of the round ligaments or ventral suspension; or the vaginal or abdominal shortening of the uterosacral ligaments or the operation on the ligaments of Mackenrodt after the technique of Alexandroff and Tweedy. If these operations would not effect a cure, we can then resort to the interposition operation of Watkins, the Mayo operation, Goffe's operation No. 2, vaginal fixation, or abdominal fixation after the methods of Harris, Murphy or Baldy, etc., with the necessary plastic work and artificial sterilization. When sterilization is necessary and the uterus is not removed, both tubes should be taken out in their entirety.

Women before the menopause present, in addition to that of child-bearing, the question of drainage of menstrual and other discharges. In the still menstruating woman no operation should be performed that will interfere with drainage. This rules out to a great extent the interposition operation, but leaves available all the others subject to the considerations discussed in relation to child-bearing. After the menopause, none of these restrictions have to be considered and leaves available the operation best suited to the individual case.

Complications associated with prolapse: Of these the most important is cystocele. The cure of the cystocele is just as important as the cure of the prolapse itself. Simple denudation of the anterior vaginal wall is not sufficient. The interposition operation of Mayo and Watkins in properly selected cases will almost invariably cure the cystocele, while at the same time curing the prolapse. The Goffe suspension of the bladder at a higher level on the uterus or united broad ligaments, with anterior colporrhaphy should form an integral part of all other operative procedures.

In general, patients with prolapse have lowered tissue tone and are not particularly good surgical risks. On account of the extensive plastic work necessary, operations take a considerable time. Many patients are advanced in years and the use of ether and chloroform entail serious dangers. In the majority McGlinn operates under scopolamine-morphine alone or with a minimum of ether or chloroform; or else under spinal anes-

thesia. Vaginal operations, as a rule, are safer than abdominal ones. Some cases, however, are such poor surgical risks that the vaginal operations necessary are contraindicated on account of the length of time. In these cases he has resorted to doing simply a high fixation of the uterus under local anesthesia. Of course the cystocele and rectocele are not entirely cured, but patients are much more comfortable, inasmuch as a large mass no longer projects from the vagina.

Finally, in cases which for any reason cannot be operated on we have a very efficient method in the Menge pessary.

Prolapse of the Uterus. A. I. McKinnon² remarks that as this condition is in reality a hernia of the pelvic floor, it should be treated as any other hernia, viz., by restoration of the parts and obliteration of the sac. This can only be done through the vagina as follows:

Make anterior vaginal section into the pelvis. Make vertical incision through vagina almost to the urethra, dissect vaginal flaps from the bladder, amputate cervix, remove sufficient posterior vaginal fornix to get rid of slack. If we have faith in round ligament operations we can do the Baldy-Webster or the Coffey operation. Next bring the uterosacral ligaments and part of the broad ligaments and stitch them to the front of cervix. Stitch the posterior fornix of vagina to the cervix and os, trim anterior vaginal flaps and stitch to uterus, high up. This pushes the bladder up, brings the uterus into anteversion and restores vagina. The parts are restored to normal position, nothing is sacrificed but redundant cervix and vaginal tissues. Future pregnancy is not interfered with.

Compare this with the classic operation in which the uterus is bisected and its belly expurgated and likewise dehorned. The bifurcated remains are inserted on either side between the rectus and sheath, anterior or posterior, according to choice. Said operation may answer the purpose for which it was intended, but is a little hard on the uterus and could hardly come under the head of conservative surgery.

Prolapsus Uteri and Its Treatment. The factors

which A. J. Rongy³ believes are concerned are: (1) Construction of the bony outlet. (2) General development of the muscles, especially those of the pelvic outlet. (3) Size of child, particularly in overdue cases. The interposition method is the ideal for correction. The results of the combined abdomino-vaginal operations have been poor because the anatomy of the anterior vaginal wall and the bladder were not considered. The most important single step in this operation is to decide the exact point of fixation of the anterior wall of uterus to the roof of vagina. Should the uterus be fixed too high, we may have undue pressure symptoms of the neck of the bladder; and if too low, the patient will always have a bearing down sensation in the vagina. During the childbearing period patients should be sterilized lest dystocia or abortion result.

A series of 100 operations was studied, of 83 in which the parity was noted, 4 were multiparæ, 5 primiparæ, the remainder had had from 2 to 17 children. The interval between the last birth and the operation (54 cases) varied from 6 months to 31 years.

With the improvement in the practice of obstetrics, hernia of the pelvic viscera will be greatly diminished. Relative disproportion between the fetal head and pelvis causing tedious labor must necessarily either stretch or lacerate the soft parts which eventually produces a prolapse of the uterus and bladder. The obstetrician should recognize this condition sufficiently early so as to prevent its occurrence. A great deal can be accomplished by carefully watching the development of the young girl; and as soon as disturbances, either of a constitutional or a local nature, are noticed, treatment must be promptly instituted, only in that way can she be prepared for motherhood.

New Operation for Prolapse. This is introduced by E. Ries⁴ and any or all steps carried out according to the findings. For instance, in a multipara who does not insist on further offspring, the vagina is disinfected with cresol, and the external skin with iodine or acetone alcohol. The bladder is catheterized. The cervix is pulled

(3) Jour. Amer. Med. Ass'n., Dec. 1, 1917.

(4) Amer. Jour. of Obstet., May, 1918.

down, disinfected, and volsella placed just below the meatus, one far out on each side of the vagina. A piece of vagina the size of which depends on the amount of redundant tissue is dissected off. The edges of the vagina are then lifted up and dissected farther away from the bladder so the lateral attachments of the bladder are freed. Then the ligamenta pubovesicalia, where distinct, are separated from the bladder a short distance and the bladder pushed away from the uterus clear up to the peritoneum, which is not opened. Now the first sutures unite the ligamenta pubovesicalia below the bladder where they are well pronounced. The next line of continuous sutures grasps the vaginal wall and where the urethra is not firmly fixed, the urethra. At the end of the urethra this suture is tied. From there on a continuous suture unites vaginal wall and fastens it at the same time to the cervix so a deep anterior fornix of the vagina is created. Coming close to the lower end of the cervix the line of incision is drawn into a transverse line and the suture made across the cervix. This finishes the work on cervix, urethra and anterior vaginal wall. The bladder has not been sutured so far at all and it lies temporarily above the anterior fornix and any oozing from it will accumulate between the peritoneum and the vagina.

The operation for the rectocele is now begun with a Hegar triangular denudation, the rectum is separated from the vagina so far as necessary and by blunt dissection of the levator muscle is laid bare on both sides. The attachment of the pubococcygeus behind the anus causes the posterior circumference of the anus to move if the freed levator is pulled on. Three or four sutures unite the edges of the levator. Then a point as much below the apex of the triangle as necessary in each case is pulled up and a suture made which distorts the upper end of the triangle into a two-pronged suture line, the two prongs lying in the posterior sulci of the vagina. The rest of the perineal plastic is done as usual. Skin sutures are made with celluloid linen, everything else with plain catgut. The perineum is covered with petrolatum as the only dressing. The abdomen is entered and the uterus exposed. Sterilization Ries accomplishes

by excising the tube out of the uterine horn in wedge shape. The gap in the horn is sutured over by a special suture or this suture is done together with the next step.

The edge of the peritoneum of the bladder is pulled as high up on uterus as the tissue will allow, thereby taking the slack out of the posterior vesical wall and fastening this wall high up on the uterus. This peritoneum and bladder is sutured to the fundus and the stitches which fasten it can be utilized to close the gap in the uterine horn if not done previously. If symphysis has been found bare, the anterior wall of bladder is pulled up and stitched to the posterior aspect of the rectus muscles as high as the slack permits. Next the parietal peritoneum is sutured to the posterior surface of uterus below the fundus so the latter is extruded from the peritoneal cavity, and the suture of the parietal peritoneum is completed. The rectus muscles or sometimes the fascia are sutured to the extruded fundus. The muscles and fascia are then united in the ordinary way and the skin closed.

Treatment of Cystocele and Prolapse During the Child-Bearing Period. Speaking at the American Gynecological Society, T. J. Watkins⁵ said he believed the transposition operation was the ideal remedy for cystocele and prolapse after the menopause. His paper was limited to the treatment of cases that could be relieved by operation which did not endanger pregnancy or labor.

The transverse incision in front of the cervix should extend freely across the anterior vaginal wall to permit the cervix to tilt up and back easily as the operation progressed. This lengthened the anterior vaginal wall and allowed the body of the uterus to drop forward without undue flexure. The anterior vaginal wall was frequently congenitally or otherwise shortened in these cases. Separation of the anterior vaginal wall from the bladder by blunt dissection with the Mayo scissors saved time and lessened bleeding and trauma if care was taken to find the plane of fascia between the vagina and bladder. The width of the separation varied.

New Operation for Cystocele. In a preliminary report, R. M. Rawls⁶ describes the technique: A small volvulum is attached to the mucosa of the anterior vaginal wall about 1 cm. above the cervix and another forceps about 1 cm. below the urethral orifice. Between these forceps a vertical incision is made through the mucosa and superficially into the underlying tissues. The incision is carefully carried forward until, in the midportion, the bladder can be demonstrated by blunt dissection. This blunt dissection is continued down until the cervical attachment of the bladder pillars and the so-called uterovesical ligaments are demonstrated. The latter is cut with scissors, keeping well in midline to avoid severing any of the cervical attachments of the bladder pillars. The bladder is separated by blunt dissection, from the cervix up to the peritoneal reflection and laterally well out to either side, and from the underlying pillars up to the urethra and well out on either side. If there is a urethrocele, the dissection is carried up to the urethral orifice. When the bladder is well mobilized, the bladder pillars are dissected from the underlying vaginal mucosa. The bladder and its lateral true ligaments are now freely mobilized and the latter overlapped from side to side by transverse mattress sutures of medium kangaroo tendon, at the level of the internal os one or two sutures enter the cervical tissue. These sutures prevent anteroposterior shortening of the anterior wall of vagina and draw the underlying fascia smoothly under the overlapping fascia. In addition the cervical suture reattaches the fascia to its original place on the cervix and forms a shelf on which the bladder rests. After the mattress sutures are tied, the free edge of the overlapping fascia is sutured, by interrupted sutures of fine kangaroo tendon, to the underlapped fascia. The paper-thin vaginal mucosa flap, caused by dissection, is now excised for a short distance on either side. Its edges are approximated in midline by interrupted sutures of 10-day chromic catgut. To prevent a dead space between the fascia and mucosa a vaginal pack of iodoform gauze is used and is removed

on 4th day. The method is applicable to all forms of cystocele, but when there is a complete prolapse of the uterus, other methods must be used in addition, to relieve the injury to the posterior segment of the "holding apparatus" and to the supporting apparatus.

Cystoscopic Study of the End-Results of Cystocele Operations. For the purpose of this preliminary report, Le Roy Broun and R. M. Rawls⁷ state that 12 patients were found to have a practically normal plane of the base of the bladder. Three of these had a mild trigonitis. The character of cystocele operations done varied greatly. The larger number consisted of freeing the bladder from the vaginal mucosa and uterus, coaptting the prevesical fascia under the bladder and approximating the vaginal mucosa after the excess had been removed. A few consisted of a simple separation of the vaginal mucosa on each side of the median incision, removal of the excess, and approximation of the edges under the bladder. One was after the old Emmet method, and one by anchoring the bladder on a higher plane to the broad ligaments and uterus, after its previous separation from the vaginal mucosa and uterus.

In 8 cases the base was found thrown into horizontal folds of varying degrees of prominence. In 4 there was no displacement of the mouths of the ureters; in the rest this displacement was very noticeable. The character of operations done in these cases was: In 3, after the separation of the bladder from the vaginal mucosa and the uterus, the prevesical fascia was united under the bladder, the excess of mucosa removed, and edges coapted. In 3, after separation of the bladder from the mucosa and the uterus, the base of bladder was anchored by silk sutures higher up on the broad ligaments and uterus, or to the shelf made by the united broad ligaments, if the uterus was removed. In 1, an oval denudation was made on the anterior wall and the edges coapted. The cystoscopic examination of these 8 patients showed the base of the bladder in each instance to be thrown into horizontal folds of varying depth and extent. In some the ureters were found displaced; in others, in addition to the displacement one or both could not be

PLATE I.

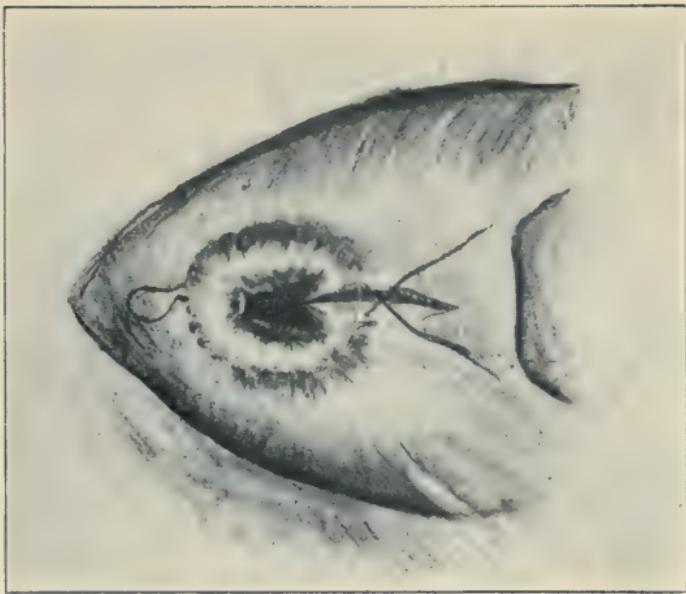


Incision through the mucous membrane and muscle.—Keefe (see p. 82).

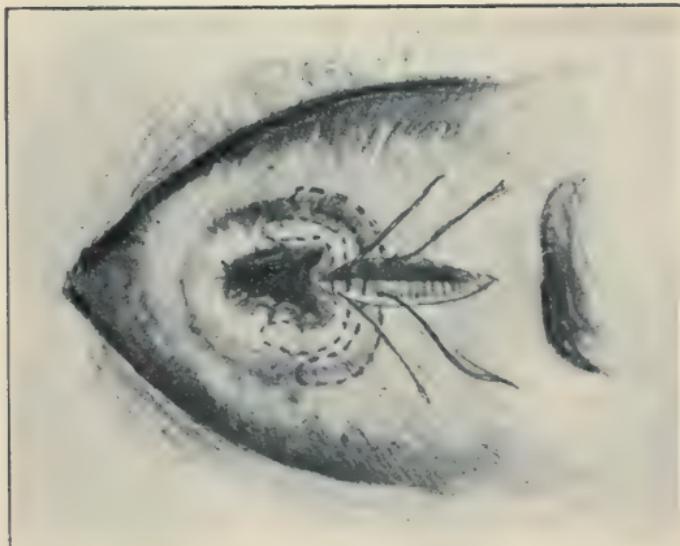


Prolapse of the urethra.

PLATE II.

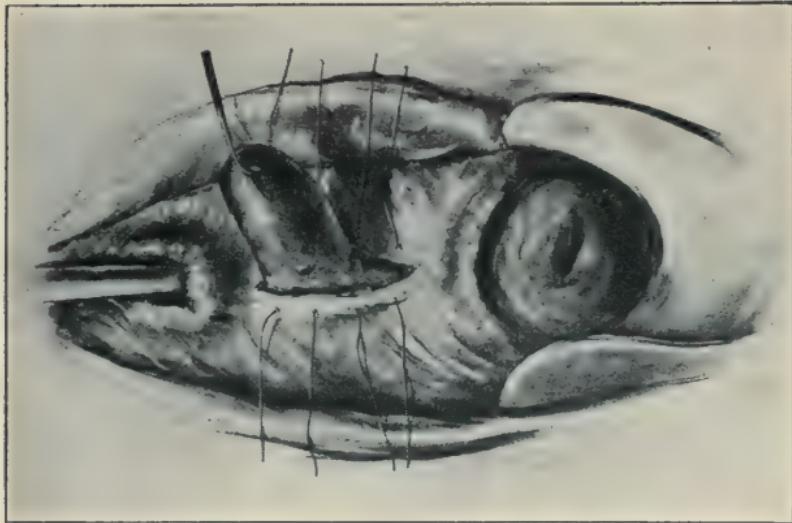


Pursestring buried suture.—Keefe (see p. 82).



Buried sutures in circular muscle.

PLATE III.



Emmett's buttonhole operation.—Keefe (see p. 82).



Interrupted sutures in mucous membrane.

located. Trigonitis of a mild degree was the usual accompaniment.

The uniform method of putting 300 c.c. of water in the bladder was followed in the entire study. When abnormalities were found, the bladder was distended to its full capacity to determine whether or not the folds would disappear. In no instance was this accomplished. The convolutions and sulci remained as first seen under the 300 c.c. distention, showing they were permanent. The kind of operation done did not seem to bear in a marked degree upon the character and extent of the permanent folds found to be present.

This study of the end-results on these patients, from the viewpoint of the anatomic condition in which the base of the bladder was left, was not flattering. The abnormal conditions found were permanent since they did not disappear under full distention.

Retroperitoneal Hematoma Following Watkins' Operation for Cystocele. While the pursestring operation is frequently done at Ann Arbor, it is only recently that 2 cases of this complication have been met with. They are recorded by R. A. Bartholomew,⁸ who remarks that the performance of both the Watkins and the pursestring Watkins is complicated in most cases by very free bleeding from the raw surface of the vaginal and bladder walls.

In the Watkins' operation if there is some persistent oozing which cannot be satisfactorily controlled by hot packs or ligatures, a small cigarette drain properly placed will prevent formation of a hematoma. In many of the cases the blood probably escapes into the pelvic cavity under the edge of the peritoneal opening through which the uterus is drawn, and is slowly absorbed. However, in the pursestring Watkins' operation there is no exit above for blood since the upper half of the vesicouterine attachment is still intact and there is no exit below, as this would sacrifice the effectiveness of the pursestring suture. Hence the added importance of thorough control of bleeding in this type of operation.

Should bleeding continue between the pursestring and the lower level of the vesicouterine attachment, the grad-

ually enlarging hematoma would tend to exert a marked pressure on the base of the bladder and extend around to either side or above the bladder as a retroperitoneal hematoma following the line of least resistance.

Prolapse of Urethra. A patient, aged 53, single, under the care of J. W. Keefe⁹ had prolapse of a week's standing. This was replaced, and the following operation done: Vertical incision in lower part of meatus, through mucosa, muscle and connective tissue. Following the plan that one usually adopts in searching for and bringing together torn fibers of the sphincter ani muscle, in a complete tear of the latter, Keefe picked up with a tenaculum the circular muscle fibers in the right side of the incision and then the fibers in the left side. The diameter of the urethra was lessened when traction was made with the tenacula. A lead probe, about the diameter of the normal urethra, was passed into the bladder, and two chromic gut sutures united the muscle ends tightly about the probe. A chromic gut stitch was now passed through the muscle, beneath the mucosa, the entire circumference of the urethra. The needle entered the wound on the right side, passed in a semicircle and made its exit through the mucosa on the upper part of meatus; reentered the same opening; passed in a semicircle on the opposite side, and made its exit in the left side of wound. This was tied with the probe still in the urethra, to prevent a too tight closure. Four catgut sutures united the edges of the mucous membrane of the wound. The probe was now removed and a Pezzer catheter passed into bladder for continuous drainage, removed the fourth day. No sign of recurrence (Plates I-III).

Two more cases were treated by A. Roldan.¹ In a girl of 15 the prolapsed mucosa on one side of the urethra resembled a polyp, and it was cauterized. In an older woman the prolapse was annular and extensive, requiring resection of a ring of mucosa. In both cases Roldan insisted on preliminary treatment of concomitant vaginitis as the first step, as infection and hypertrophy of the mucosa are the main factors in the prolapse.

(9) Jour. Amer. Med. Ass'n., Dec. 8, 1917.
(1) Med. Iberia, March 30, 1918.

TRAUMATISMS.

Vesicovaginal Fistulæ. The principles underlying spontaneous closure and surgical repair are discussed by R. T. Frank² founded on 3 of the former and 19 of operative repair. He lays stress on the fact that free mobilization of the bladder is the most important single condition for success. When the bladder is freely movable the fistula will heal spontaneously in many cases. An inverted T-incision, as for interposition of the uterus, is a most satisfactory routine procedure. Suture is usually in two layers with chromic gut and silk. If there has been destruction of the urethra or vesical sphincter, and repair is almost impossible, interposition of the uterus gives the least unsatisfactory result. In one case a minute fistula, persisting after the closure of a large hole, healed after treatment with the d'Arsonval current for ten seconds. Following operation the retention catheter should be employed and if a leak develops, the catheter should be continued for several weeks.

G. G. Ward, Jr.,³ discusses the *operative treatment of inaccessible fistulæ*. These are becoming more frequent owing to the increasing use of the extended operative removal of cancer of cervix, and the introduction of the Percy method. To obtain adequate exposure, Gray resorts to the Schuchardt paravaginal incision, "our most effective means of obtaining free access to the vaginal vault for operative procedures in difficult cases." Free mobilization of the bladder also necessary, may be had most easily by establishing a plane of cleavage between the uninjured vesical and vaginal tissues. A crucial incision is made in the anterior vaginal wall, beginning near the urethral meatus and having its transverse bar at the fistula. Then freeing the vagina from the bladder near the urethra first and gradually dissecting up to the fistula. A sound in the bladder to displace the bladder injury downward is helpful. In suturing, if the bladder and vaginal walls are not superimposed, the chances of healing are much better.

(2) Surg., Gynecol. and Obstet., November, 1917.

(3) Ibid., August, 1917.

PART V.

INFECTIONS AND ALLIED DISORDERS.

Appendicitis and the Gynecologist. About an inch and a half to the right of navel and a trifle caudad, one will find on deep pressure a hypersensitive point in *chronic appendicitis*. It does not belong to cases of pelvic irritation or infection, except with a similar point to the left of navel. This point to the right will differentiate between chronic appendicitis and various pelvic irritations or infections. At that site we shall find the right lumbar sympathetic ganglion. On the left side of the navel we find the left lumbar ganglion. Apparently these ganglia represent the sensitive points. There is no direct nerve connection between the appendix and the right ganglion.

R. T. Morris* postulates that the irritated appendix sends an afferent impulse to a segment of the cord, and from that segment an efferent impulse goes out to the skin over the area belonging to the appendix. At the same time, a similar impulse goes out to the right lumbar ganglion and stops there. A certain time is required for the nagging appendix to excite the sympathetic ganglion. In acute appendicitis the greater degree of sensitiveness is at McBurney's point. In chronic appendicitis the greatest tenderness is at the point 1 1/2 inches to the right of navel, and corresponding to the right sympathetic ganglion. The reason this ganglion is hypersensitive, only in company with its left neighbor in pelvic disturbance, is the crossed action of the sympathetic and autonomic nerve branches between the pelvic and the lumbar ganglia causes irritative impulses to be shot simultaneously into the lumbar ganglia of both sides.

In chronic appendicitis, the second feature which does not belong to acute appendicitis, nor to pelvic disturbance, is persistent distention of the ascending colon with gas. We may assume that irritation from the nerve elements of a chronically inflamed appendix at first over-stimulates the innervation of the muscularis of the colon. This carried on for weeks or months, eventually tires out the innervation. When the innervation becomes wearied, the muscular coat of the colon becomes relaxed and distended with gas, which it fails to press onward because of comparative lack of energy.

Pus in the Female Pelvis. In this "surgical retrospect," J. Y. Brown^{4a} comes to conclusions as follows:

1. Many patients with acute salpingitis recover and remain permanently well without intervention.
2. Ninety-eight per cent. of such cases will become quiescent and the pathology be limited to the pelvis.
3. With rare exceptions, operative work should not be undertaken in the acute stage of pelvic inflammation.
4. When operative work is undertaken, it should be radical in the extreme.

[What is meant by radical in the extreme? Opening the abscess by the vagina, even in the acute stages often saves life and results in permanent cure.—E. C. D.]

Focal Infections of the Female Genitalia. No search for the primary site, according to F. J. Taussig^{4b} should omit a thorough examination of the entire genital tract. The consideration of this subject may be done under two heads: (1) Cases in which the primary focus is elsewhere and the genital organs are secondarily involved. (2) Those in which the primary focus lies in the genital tract.

1. In this group the causal organism may be the streptococcus, the colon- or the typhoid bacillus. The organ infected is usually the tube or ovary, especially ovarian retention cysts.
2. The group in which the primary focus lies in the genital tract is more numerous, and may be subdivided into (a) the acute infections; and (b) the chronic infections. Under the former head should be properly in-

(4a) Jour. Amer. Med. Ass'n., Aug. 10, 1918.

(4b) Jour. Missouri State Med. Ass'n., June, 1918.

cluded the septicemias associated with the pregnant state.

The treatment will usually consist of the removal of the offending organ. Taussig would, however, caution against any routine removal of pus-tubes until other accessible parts of the body had been corrected without relief of systemic disturbances. The determination of the primary focus is always somewhat of a gamble. He hesitates, therefore, in recommending a laparotomy upon women with symptoms of focal infection unless the pelvic condition causes very definite symptoms in itself or until other possible sources are carefully excluded.

A pyometra can usually be corrected by thorough dilatation and drainage of the uterine cavity without removal of the organ itself. Occasionally, however, hysterectomy will prove necessary. Infections of Bartholin's gland are best treated by removal of that structure. As to the use of bacterial antigens as vaccines, his experience has been disappointing both in the stock and autogenous vaccines and both in the acute and chronic pelvic infections. This applies particularly to the gonococcus vaccines.

More attention should be paid to the after-treatment of these cases. We are too apt to be content with the removal of what we believe to be the primary focus. Patients should be made to realize that only in a few instances will this alone give prompt results. It usually requires a long time before the patient is able to throw off completely the secondary infections present. To accomplish this more readily we must build up the personal resistance by a prolonged period of rest, fresh air and good food. These principles of therapy that are so important in the acute septicemias apply equally to the chronic focal infections. Let us see to it that our patients get all the sunshine, oxygen and nourishment they can possibly absorb. Only by so doing can we bring to a successful issue the favorable conditions produced by removal of the primary focus.

[In addition to the above treatment of pyometra, I suggest radium by intrauterine application. Say 5 mg. well screened for 6 hours.—E. C. D.]

Use of Sulphur in Vaginitis. This is recommended by F. P. Gill⁵ in the form of ointment.

R	Sulphur. præcipitat.	ʒij.
	Paraffini mollis	ʒiv.
M.	Fiat unguentum	

A piece of lint, 2 inches wide and 12 long, is thickly coated on one side with the ointment. It is then folded in the middle of its length over the top of a pencil or introducer 8 inches long, the ointment being outside. The lint is then introduced, right up between the cervix and posterior fornix. The pencil is then withdrawn leaving the lint *in situ*, and in close contact with the anterior and posterior walls of the vagina which retain it in its position, any extruding ends of the lint being simply tucked up inside the vaginal orifice. This is done night and morning, preceded by a good douching of warm water and soap, before fresh lint is introduced. When there is uterine or ovarian pain or tenderness, or in acute cases, the same ointment is thickly plastered over the hypogastrium, a piece of soft paper protects the clothing.

The local action of sulphur ointment is due to the great affinity of sulphur for the hydrogen always abundantly present and active in congestions and discharges, and to the extraordinary permeability of the skin and deeper tissues to this ointment. The sulphuretted hydrogen is generated *in situ* and penetrates deeply into the affected tissues—in a nascent form. It is a most powerful germicide. Further, the application is remarkably soothing, cooling, and grateful, especially in the more inflammatory and acute cases. The offensive odor begins to disappear very soon, and the normal condition is quickly restored.

Ulceration of Vulva. The case of acute ulcer narrated by H. Schiller⁶ was preceded and accompanied by chills and fever, burning and general malaise, acute ulcerations which had all the characteristics of soft chancre. The presence of a peculiar form of bacilli in all smears, absence of all other microbes and the rather

(5) Practitioner, July, 1917.

(6) Amer. Jour. of Obstet., March, 1918.

unusual clinical picture show this was not one of the known ulcerative processes of the vulva, but a lesion not previously described.

Inveterate Pruritus Vulvæ Treated by Resection of the Perineal Nerves. The patient operated on by M. Mauclaire⁷ was 34 years old, on May 8, appendectomy was performed with suspension of uterus and almost complete resection of left ovary. The pruritus appeared soon after. Nov. 15, another suspension operation, the cystic right ovary partly resected. By December, the pruritus was unsupportable, all local measures failed, the sole relief—and that only momentarily—was from injection of hot water. About 3 ctm. of right superior perineal (or clitoridean) branch resected, and on the left side, 4 ctm. of the inferior perineal branch.

Last seen the following October (11 months later) she still had slight smarting kept up by a persistent vaginal discharge. No itching since operation. The right side is more hypoesthetic than the other.

Treatment of Chronic Cystitis. This being a local disease it is useless to give any drug by the mouth. There is no drug so much abused at present as hexamethylenamine in genitourinary disease. The symptoms of cystitis are produced by the free use of this remedy, and I. S. Stone⁸ has had such cases referred to him for treatment. Urine of high sp. g. should be diluted by the free administration of water if there is irritation from this cause. However, by this means we may cause more distress by compelling a patient with a contracted bladder to rise frequently at night.

The underlying principle in cystitis is to treat it as a local disease, and to do this one must apply remedies directly to the entire mucosa. At each sitting the bladder should be filled with hot normal saline or 2-per cent. boric acid solution, using as much pressure as the patient can fairly well bear. This stretching is invaluable because it not only overcomes muscular contraction, but unfolds the mucosa, permitting the irrigant to reach the utmost crevice. As a rule, Stone relies upon comparatively weak solutions of protargol, 1- and 2-per cent.,

(7) *Annales de Gyn. et d'Obstét.*, September-October, 1917.

(8) *Amer. Med.*, January, 1918.

never stronger. Two ounces of one of these solutions is left as a last act in the treatment, and the patient usually retains it until she reaches home. Tri-weekly sittings are quite often enough to secure a rapid recovery in most instances.

Trigonitis often requires special local applications, such as 5- or 10-per cent. silver nitrate solution. These should be applied through the cystoscope if possible. If the patient is at all nervous, one must expect bladder spasm, and indeed, any patient may not bear the stronger solution. Spasm may occur during the routine treatment of dilatation and medication of the bladder. It occasionally causes intense suffering and may require morphia for its relief. When it occurs during the usual office treatment with mild applications, it may be necessary to suspend the sitting, but will rarely require sedatives.

Pelvic Conditions Producing Bladder Symptoms. In certain pathologic conditions the urinary symptoms are so pronounced as to divert attention from the true to false etiologic factors. According to Max Emmert^{8a} the most prominent of these symptoms are: (a) Frequent urination; (b) pains in the bladder; (c) painful urination; (d) feeling of insufficient emptying of bladder; and (e) a feeling of weight in the bladder which is relieved by urination.

I. The most frequent causes of these extraneous symptoms are displacements either in a retro position or prolapsed condition. With the normal supports of the uterus weakened or destroyed, it drags upon the bladder through the utero-vesical ligaments, which are simply folds of peritoneum enclosing loose bands of connective tissue. However, we know that traction upon any part of the abdominal peritoneum is productive of pain. In one case the urinary symptoms were produced by traction exerted on the bladder through the utero-vesical ligaments. When the uterus has been separated from the bladder, because of rupture of these ligaments the urinary symptoms are less marked or totally absent.

In another case the cystocele was the chief cause. When erect it produced a constant desire to urinate, be-

cause of the rapid filling of the cystocele pouch. The act of urination never completely emptied the bladder consequently the pouch rapidly filled enough to produce the stimulus. In the prone position the bladder would fill to the normal extent before producing a desire. Many patients soon learn that, by pressure with the fingers upon the cystocele pouch following urination, they can empty the bladder more completely and thereby obtain relief for a longer time.

II. There are a number of tumor formations which, by the mechanical traction and pressure, produce symptoms of bladder irritation while the symptoms due to their position and involvement may be of secondary consideration.

III. Among the other pelvic conditions causing bladder symptoms are salpingitis with pus formation and tubal pregnancy. With these conditions, however, the bladder symptoms are of secondary consideration. Practically all pelvic conditions which cause adhesions will be productive of bladder symptoms sooner or later.

A combination of the above-mentioned causes may produce bladder symptoms as is strikingly illustrated by the following history: Mrs. S aged 47. Nullipara complained of "frequent desire to urinate and pain in the bladder." About six months ago began to suffer from a pressure on the bladder which caused a frequent desire to urinate. At that time it was possible for her to void only a small amount of urine which failed to give relief. She would have severe pains over the bladder on awakening. Ten weeks ago noticed a mass in lower abdomen. Operation revealed a large cystoma of the ovary, fibroma uteri, and chronic pelvic inflammatory disease with adhesions.

Malignant Syphilis of the Uterus. The classic article of Gellhorn and Ehrenfest was referred to in the 1917 volume (p. 120). G. Gellhorn in a recent communication⁹ gives a full case-report:

In a colored patient, aged 17, a syphilitic infection ran its entire course from the initial stage to a fatal ending in less than a year. The diagnosis was secured by findings of spirochetes in the secretion and in the

tissues of an extensive secondary ulceration of the cervix. A point of unusual interest was the symbiosis of spirochetes and gonococci in the ulcer. Within two months this ulceration had changed into a large cauliflower tumor, which, histologically, presented a clear-cut picture of gumma. In this stage the Wassermann was negative, obviously due to the fact that the marked and rapidly progressing cachexia prevented the formation of antibodies. Antisyphilitic treatment was of no avail, and the patient died of a perforative peritonitis from a retroperitoneal abscess. This abscess, primarily, was in all probability a gumma which had extended from the cervix into the pelvic cellular tissue and had eroded large portions of the pelvic bones. Secondarily, microbes invaded this gummatous infiltration from the necrotic surface of the cervical tumor and brought about an abscess which eventually broke into the abdominal cavity. The finding of a gumma in one ovary should be recorded because of its excessive rarity.

The rapidity and intensity of the syphilitic process in this case was, perhaps, due to a particularly virulent strain of spirochete, aided and abetted by a racial lack of resistance.

Tertiary Syphilis of Cervix. In 1916, Gellhorn and Ehrenfest cited 21 examples of this condition, and O. H. Schwarz¹ adds another. The patient, aged 35, was admitted Oct. 29 for vaginal hemorrhage. Some two years before had slight amnesia but recovered in 2 months. There was also complete loss of vision in left eye.

After examination a diagnosis of tuberculosis or gumma was made. Tissue was removed for injection and staining. Injected guinea-pigs proved negative; several sections stained for tubercle bacilli proved negative; about 200 were unsuccessfully studied for spirochetes; Wassermann was positive 2 plus.

An examination Nov. 25 showed the cervix definitely enlarged; the same as on previous examination, it was thought advisable to remove a piece absolutely to exclude carcinoma. The section showed no malignancy, but did show marked endarteritis. Round-cell infiltration was not conspicuous, nor were there any definite areas show-

ing epithelioid cells. No giant cells were found; the tissue appeared more or less edematous and there were definite areas of hyaline change. Patient had had vigorous treatment with mercury, iodide and salvarsan. An examination just previous to discharge (Dec. 1) showed the cervix about twice normal size, anterior lip larger. Freely movable, not tender, fairly firm; has a distinctly roughened surface, no loss of tissue, except where sections were taken. These were healing by granulation.

Jan. 15, the cervix was found entirely healed and of almost normal size and consistency. It presented only a slight bilateral laceration and a small indentation in posterior lip. No vaginal discharge and cervix everywhere covered by normal squamous epithelium. Since the antisyphilitic treatment was instituted, patient has had three normal menstrual periods; gained about 8 lbs. Since the middle of December is gradually regaining sight.

Genital Tuberculosis in Women. A series of 9 cases is analyzed by U. Tassoni,² and from a study of them and of the literature he concludes the infection may develop in any part of the reproductive system, but the seat of predilection is the Fallopian tube, 7 out of his 9 cases. A reason for this is that the tube is in close proximity to the intestines and the peritoneum—frequent seats of the disease; another is the narrowness and bending of the tubal lumen, which may give a resting place for the bacilli. The ovary and vagina are almost exempt. A hypoplasia of the reproductive organs predisposes to the malady, and this condition was met with in 7 out of the 9 cases also. Primary infection (coitus) is possible; but secondary infection is the rule. In 7 patients there was antecedent tuberculosis of the pleura, peritoneum, or lungs; and the period between the primary infection and the secondary genital manifestations varied from 2 to 15 years. The disease produced sterility, 4 women never having borne children and 5 only having conceived before they became tuberculous.

As a rule, genital tuberculosis runs a long course, and the early symptoms are vague. The adhesions which the

(2) Ann. di Ostet. e Ginec., 1917, p. 25.

affected genital organs may develop in connection with neighboring parts may interfere with the functions of the latter; in one patient intestinal constrictions was thus produced, necessitating resection. In one case gonorrhea coincided with the tuberculous infection, and another woman had been infected with syphilis. The treatment to be preferred consists of the removal of the tuberculous focus in circumscribed forms, and of the whole generative apparatus in widespread infections. When the process has spread to other organs and is not suitable for intervention general means must be relied upon.

Sudden Postoperative Death and Tuberculosis of the Suprarenal Bodies. Brindeau³ reports the case of a woman who while in apparent health was operated on for perineal rupture. Pigmentation on the face suggested a so-called mask of pregnancy which had not cleared up but according to the patient this she had "always" had. She bore the operation well and on the first postoperative day the vaginal gauze was removed. She was given opiates by mouth and complained much of thirst. On the second day she was found dead in bed. Necropsy revealed nothing abnormal in the operative field. There was slightly advanced tuberculosis of the lungs and tuberculosis of both adrenals. The death was thought to be due to sudden insufficiency of the adrenals produced by action of the chloroform upon the diseased organs. This opinion was corroborated by macro- and microscopic alterations of the liver and kidneys of the type seen in chloroform deaths.

Surgical Treatment of Pelvic Infections. In his discussion of this topic, particularly as to when operation is to be employed, E. E. Montgomery⁴ states it is indicated when the disease is localized by a palpable collection in the pelvis, tubes, ovaries, or the uterine walls.

The governing principles should then be: (1) To save rather than to sacrifice. No organ should be removed where patience and judicious treatment afford an opportunity for its retention and the restoration of the patient to good health. (2) Where sacrifice seems nec-

(3) Arch. Mens. d'Obstét. et de Gyn., 1917, p. 159.

(4) Therapeutic Gaz., Sept. 15, 1917.

essary, if the condition of the organs will permit the retention of an ovary or at least a part of one, it should be retained, for even if there is no longer opportunity for procreation a portion of an ovary will permit the formation of the directing secretion, and prevent the annoying symptoms associated with premature menopause. (3) Where both ovaries are so diseased as to make the retention of any part of them dangerous to health and life, the uterus showing indications of extensive disease, the latter organ should be partially or entirely removed according to the condition of the cervix.

The Endometrium in Health and Disease. A combined bacteriologic and histologic study has been made by A. H. Curtis⁵ of material from uteri removed by operation especially by E. C. Dudley and T. J. Watkins; no scrapings were used. He distinguishes between nulliparous and parous patients. Among the latter pregnancy has introduced the possibility of fundus contamination and has also rendered the cervical canal relatively more patent for the ascent of germs. Each of these groups has again been divided into those in which the history has been normal and with history or operative evidence of pelvic infection.

Group 1. The endometrium of nullipara without infection. Of 26 supposedly non-infected cases, cultures and tissues were normal in 23. Streptococci were isolated from 1, while in 2 cases, which had been curetted respectively eight and six days before hysterectomy, mixed growth appeared and the histologic evidences of endometritis were present. *Group 2.* With infection. Of the 13 patients 12 yielded no growth. Histologically 9 of these were normal, 1 showed tuberculosis, 1 a slight cellular infiltration and 1 was invaded by polynuclear and plasma cells. The endometrium of a case with recurrent infection of sixteen years' duration yielded gonococci and histologic evidence of chronic endometritis. *Group 3.* The endometrium of parous women without infection: Of the 47 in this class, in only 2 cases did the endometrium show growth. One of these patients, with intra-uterine manipulation preliminary to operation, yielded a moderate number of colonies in mixed

culture and was microscopically normal. The other, a victim of persistent uterine hemorrhage, showed anaerobic streptococcus infection and microscopic evidence of endometritis. *Group 4.* The endometrium of parous patients with infection. Of the 32 patients 9 showed a growth in the culture of the endometrium; 4 of these, regularly exposed to reinfection, yielded gonococci and showed histologic subacute endometritis. Another without exposure for six months had inflammation of the endometrium and Fallopian tube with gonococci from both. Two cases of many years' standing yielded respectively a diplococcus and a streptococcus. Ten endometria without growth proved microscopically normal, 2 contained round cells, 1 a postmenstrual polynuclear increase, 7 had plasma and round cells and 3 revealed distinct endometritis.

As a result of these investigations, Curtis has come to the conclusion that, pyometra and recent exploration of the uterus excepted, the endometrium almost never shows bacteria except when there is infection of adjacent pelvic tissues. Chronic endometritis *per se* with bacteria in smears or cultures is practically to be ruled out as a clinical entity.

Several points of clinical importance come up: First infection of the endometrium consequent to curettage. In certain cases normal scrapings have been obtained from the uterus; then, several days thereafter, in the endometrium secured by hysterectomy, mixed cultures and endometritis have been found. Infection is perhaps not a customary result of curettage, but it appears not uncommon. Preparation for instrumentation of the uterine cavity does not ordinary include cleansing of the cervical canal. Yet this tissue is freely accessible to all vaginal flora. It is a wise precaution gently to introduce an iodine applicator as far into the cervix as it is patulous before passing instruments.

If curettage tends to contaminate the endometrium, why does infection not complicate hysterectomy in patients with preliminary curettage. Fortunately, Nature can dispose of a few bacteria at the time they are introduced. But patients not operated upon until several

days later, when the bacteria have had time to multiply, are not ideal subjects.

At the close of menstruation there persists a poly-nuclear leukocytosis. It would seem desirable, other conditions being equal, to choose this time for operation, when these protective leukocytes are available for aid in convalescence.

At the time of hysterotomy or of subtotal hysterectomy it is requisite that we know whether the endometrium can be handled with impunity. It appears that if the tubes and other pelvic viscera are healthy, spread of infection from the endometrium need not be feared. Exception must be made in pyometra or if the uterus has been recently explored.

Chronic infection of the corpus uteri speaks for almost certain involvement of other pelvic organs. Intra-uterine applications are therefore of little avail, for the most important focus of infection is well beyond their reach. Again, in the absence of bacteria, it may be desired to rid the patient of a persistent discharge. Study of this question makes it appear that mucus secreted from the body of the uterus is in very small amount, and limited mostly to the premenstrual period. In the cervix are glands, prolific in activity, especially adapted to mucus secretion. It is here, in the cervix, up to the level of the internal os, that we will do best to look for infection, and it is against discharge from the cervix that treatment can be efficiently directed.

In the discussion S. S. Schochet remarked that there were but 5 cases of syphilis of the uterus, and in 1 of these the endometrium was affected. He asked whether the spirocheta was demonstrated in Curtis' case, and whether the endometrium was involved.

To this Curtis replied that he found syphilitic changes in the muscle and fascia, but was unable to obtain spirochetæ. There was nothing particularly abnormal in the endometrium except a large infiltration of plasma cells.

[The work of Dr. Curtis stands on a high plane of scientific excellence.—E. C. D.]

The Endometrium and Endometritis. H. M. Tigert⁶ believes the curette should be limited to diagnostic pur-

poses in the non-infectious types of endometrial pathology. Acute infectious endometritis should be let severely alone, since the endometrium in the vast majority is quite able to take care of itself and usually returns to normal. Those cases secondary to other pelvic pathology will usually promptly recover when the primary condition is removed. Severe grades of chronic interstitial endometritis and persistent hyperplastic types may demand hysterectomy.

Treatment of Cervical Catarrh. The secret of success here, according to A. Heineberg,⁷ lies in the preparation of the mucosa. The cervical canal in health contains a plug of mucus, in pathologic conditions this is increased in quantity, muco-purulent and more tenacious. Most of the medicinal agents used in the treatment of diseased mucosæ coagulate mucus as soon as they come in contact with it. The resulting coagulum acts as a barrier to the drugs. The cervical discharge can be easily and thoroughly dislodged by irrigation of the cervical canal with a weak alkaline solution of the following:

Sodii bicarb.,

Sodii chlorid.,

Sodii borat., equal parts.

Dissolving 1 dram in 1 pint of water.

The syringe consists of a silver Eustachian catheter attached to a 10 c.c. Luer syringe by an adapter. The silver catheter is malleable and may be easily bent to accommodate itself to the canal. The tip of the catheter is introduced well into the cervical canal and the fluid expelled under sufficient pressure to dislodge the mucus. Several syringefuls may be necessary. There is not much likelihood of forcing the solution into the uterine cavity. Before beginning treatment the condition of the internal os should be determined with a thin sterile probe. If it is found to be much dilated, as it rarely is, the alkaline solution should be applied on cotton-wrapped applicators instead. When the cervical mucosa is entirely clean it should be thoroughly dried with cotton and is then ready for the medicating agent. No drug is as beneficial as silver nitrate.

In aggravated cases of long standing, in which the mucosa is greatly thickened and erosion extensive, begin the treatment with a 50-per cent. solution, applied every three or four days. The first few applications are apt to cause bleeding from the eroded surface. As the discharge lessens and becomes thinner and less purulent, the strength of the solution is gradually decreased to as low as 10 per cent.

If the cervix is large and boggy, Heineberg supplements the silver nitrate with boroglycerin on wool tampons until the cervix is reduced in size. The erosion gradually decreases through substitution of stratified squamous for the thin columnar epithelium. The patient is given a prescription for the alkaline powder with directions to use a tablespoonful in two quarts of warm water as a douche once or twice a day, depending upon the amount of the discharge. The cases of bad erosion and ectropion which were formerly subjected to high amputation to get rid of the diseased tissue, require after the treatment only trachelorrhaphy or a moderate amputation, if any at all.

Treatment of Leukorrhea With Lactic Acid Bacilli.
In chronic leukorrhea, with the exception of one type, the reaction of the vaginal secretion is distinctly alkaline. After observing these facts in a large series of cases, F. B. Block and T. H. Llewellyn⁹ formulated the theory that if they could change the reaction of the vagina from alkaline to acid, and maintain an acid reaction, they might be able to control or, perhaps, cure the leukorrhea.

While bouillon cultures give the best results, they are impracticable, owing to the difficulty of always having a fresh culture on hand. Tablets with lactose are potent for weeks if kept on ice.

After thorough cleansing by a simple alkaline spray, the vagina is dried with cotton pledges. A lactic acid tablet, preferably one readily soluble and made with a lactose base, is moistened with *one or two drops* of sterile water by an eye-dropper. If the proper tablet is used, and only enough water applied to moisten it, it will attain the consistency of thick cottage cheese,

and may be readily lifted by forceps. It is then placed in the upper vaginal canal, and spread over the walls and on the cervix by the forceps. If the tablet is of the proper consistency, it will adhere to the mucosa and show no tendency to run out, as with solutions. The speculum is next withdrawn half way, with its blades open, to allow the upper canal to close over the tablet. Finally the blades are closed and the instrument is withdrawn. No tampons are applied. The patient is instructed to return in a week, and all douching is absolutely interdicted. The same technique is repeated, and she returns once a week for a reimplantation, until the vagina is acid—in a favorable case about 3 or 4 weeks. After the reaction has become acid, no treatment is given so long as it remains so, although the patient returns at gradually increasing intervals to have the reaction taken. In favorable cases it is usually necessary to reimplant at intervals of 3 or 4 weeks, since, after that time, the organisms seem to die, or at any rate to lose their potency. The treatment is seldom a permanent cure but rather a good palliative measure, requiring attention about once a month and superseding douches.

In vulvovaginitis in children, when the gonococci have largely disappeared, the use of the bacilli seems to be of some value in reducing the discharge and lessening the vaginal irritation. In the nonspecific types of vaginitis in children, the results are more encouraging. Results are practically nil in cases in which there is a gross pelvic pathologic condition. A large number in which the leukorrheal discharge is the chief symptom, and in which no definite disease can be determined, nonspecific catarrhal endocervicitis almost uniformly present an alkaline reaction, and, in approximately 50 per cent., will respond to the treatment. In senile or atrophic vaginitis, the writers have had their best results, about 80 per cent. of improvements.

Preservation of Menstruation in Salpingitis and Metritis. It is the opinion of J. O. Polak² that the number of sacrificial operations in young women may be materially reduced by giving Nature time to absorb

exudate, sterilize tubal contents and regenerate function. For chronic tubal disease, especially where the gonococci or streptococci are concerned, simple ablation does not remove enough of the diseased tissue. Menorrhagia and leukorrhea persist and the tubal stump becomes a focus for continued infection. While hysterectomy in chronic pelvic inflammatory disease may effect a cure, the conserved ovary quickly loses its function, as the circulation is frequently impaired and even its internal secretion is short lived. It should be the aim of the gynecologist to preserve both ovulation and menstruation.

The ovarian circulation can be maintained and the menstrual function preserved by the employment of the Bell-Beuttner technique, ablation of both tubes with resection of the infected fundus of the uterus, leaving sufficient healthy uterine body to conserve the menstrual function and one or both ovaries to continue ovulation. Removal of the tubes and resection of the upper segment of the uterus can be done without interfering with the ovarian circulation. Hence, the ovary may be retained with a greater degree of security than if a hysterectomy is done and the uterine end of the anastomosis cut off. The ovary is the analogue of the testicle, and considerable surgical risk is justified for the preservation of an ovary, for it is well known that double oophorectomy, particularly in a young woman, may convert the normal woman into a hopeless neurotic.

Of 20 cases in which operation was performed by this technique, two have had infected wounds, and one a diffuse bilateral parametritis. In the last 17 recovery has been smooth and complete, the uterus being small, well antverted and freely movable at the time of discharge. All but two have been followed for from two months to three years. All patients menstruate regularly and painlessly and have free pelvis. Only one has a leukorrheal discharge.

Torsion of a Pyosalpinx. Twisting sufficient to cause strangulation seems to be rare, *e. g.*, it was not met with in Goth's 700 cases. Therefore, M. T. Sudler³ believes

a case in a patient, of 20, will be of interest. There had been several attacks of cramplike pains on right side, for 5 days prior to admission. Operation disclosed a pyosalpinx which had been turned one and a half revolutions towards the right and completely strangulated, being black and edematous. There were no adhesions. The mass was removed. On the left side there was a mass of similar size, with very light adhesions and not strangulated. It also was removed. There were some slight fibrin deposits on the small intestine. The appendix was looked for casually, but as the cecum was not seen and there seemed to be no evidence of a pathologic appendiceal condition, the search was not continued. Primary union, uneventful recovery.

Statistical Study of 100 Cases of Pyosalpinx. This is contributed by H. Grad⁴ and based on operations by various members of the staff of the N. Y. Woman's Hospital. There was one death, a patient, of 39, who had large tubo-ovarian abscesses. Double salpingo-oophorectomy and appendectomy was done. The case was serious from the start, the temperature was higher every time it was taken, finally reaching 106° F. No necropsy, though death was apparently due to peritonitis.

Résumé of Operations:

Removal of uterus, both tubes and ovaries.	18
Removal of both tubes	62
Removal of one ovary	15
Vaginal section for pus	5 (100)

In 85 per cent. the recovery was "smooth," moderate rise of temperature and pulse, no complications, e. g., hemorrhage and shock, no undue suffering, little or moderate distension, and the incision healed satisfactorily. In the remainder it was "stormy," i. e., more or less shock, temperature and pulse rise considerably, distension is more or less marked, and in some the suffering is quite intense. It is, however, interesting to note how complete is the recovery of these very sick cases when the focus of infection is removed.

Patients generally leave in seventeen days on the average.

End-Results of Operations for Pyogenic Infections of the Fallopian Tubes. J. G. Clark and C. C. Norris⁵ have studied the postoperative and remote results in over 500 cases. These confirm the current opinion that intervention in the acute stage is contraindicated. Conservative preparatory treatment both decreases the mortality, and increases the prospects for ultimate good functional restoration of the organs in the pelvis.

In the majority, temperature falls, pain leaves, the enlargements of the tubes lessen in size and may become impalpable. No operation is advised if patients are seen during the first attack. If there is a recurrence the same conservative treatment is followed, but when the symptoms have subsided operation is advised. Usually both tubes are removed and the ovaries are conserved.

If the symptoms do not subside under the conservative treatment, vaginal drainage is instituted, either by direct incision into the cul-de-sac or through the guidance of an abdominal incision. It is very rarely that a patient dies under the conservative treatment—none in the present series. If the symptoms do increase there is ample time for a simple drainage operation. Drainage through an abdominal incision should be used only where it cannot be avoided.

When the acute attack has subsided it is possible to determine more exactly the extent of the involvement of the tissues, and, if conservative operating is indicated, it can be performed more satisfactorily. Conservative procedures, instituted with a view to restoring a closed tube, seldom restore fecundity, hence should be undertaken very rarely. Conservation of ovarian tissue should be limited chiefly to patients under 30.

In sexually mature women, if chronic infection of the uterus and adnexa is present, hysterosalpingo-oophorectomy is followed by a lower mortality and more certainty of restoration to health than are conservative operations.

(5) *Surg., Gynecol. and Obstet.*, July, 1918.

Clark and Norris strongly condemn Coffey's method of walling off gonorrhreal infection in the pelvis from the general cavity by a "quarantine pack." The pack entails some danger and is quite useless because generalized gonococcal peritonitis is very rare.

PART VI.

MALFORMATIONS AND TUMORS.

Complete Atresia of Vagina. Details are given by J. F. Baldwin⁶ of an VIII-para, aged 58, menopause at 43. She was sent in because of very frequent urination both day and night, for four years, but had been much worse during the past few months. There was no evidence whatever of any vagina. Rectal examination showed the uterus moderately enlarged, globular and quite tender. Cystoscopic examination showed only a mild cystitis, but pus coming from each kidney.

As the pressure of the uterus upon the bladder had been supposed to have much to do with the cystitis, an operation was done for its removal. Under the anesthetic a most thorough examination was made in the hope of finding at least a sinus to represent the vagina, but nothing whatever could be found. Examination with one finger in the rectum, and another in the bladder, showed complete absence of anything resembling vaginal tissue. On opening the abdomen, as previously determined, the uterus was found to be globular, this shape being clearly due to the retention of secretions. An abdominal pan-hysterectomy was, therefore, made as usual, except that after incising and separating the peritoneum it was found the cervix was simply held by connective tissue, and that there was no trace whatever of a vagina present. The peritoneal edges of the opening were whipped together with continuous catgut, and the abdomen closed. On examining the uterus, it was found that the cervix was occluded throughout its entire length, and that the distention was due to a collection of pus.

Congenital Absence of Uterus and Vagina. Describing 6 cases, E. Novak⁷ states they can be explained on

(6) Surg., Gynecol. and Obstet., April, 1918.

(7) Ibid., November, 1917.

embryologic grounds, though the real cause is still obscure. While such anomalies have been often met with in sisters, in most cases the influence of heredity is unimportant.

In the absence of the actual menstrual flow there was, with the majority, definite molimina, which are accounted for by the increased congestion of the pelvic structures, although there be complete absence of uterus and vagina. It would seem that in most cases the ovaries are present, normal in structure and function, which is regular, and with the formation of corpora lutea. Vicarious menstruation is occasionally met with and is, however, more common than when the uterus and vagina are present.

The general development falls into two groups. The first, and by far the larger, embraces individuals who to all appearances are normal in structure and function. The second group includes those in whom there is a more or less pronounced admixture of masculine element, and here there is frequently some ambiguous malformation of the external genitals. The sexual function and feeling in the majority is described as normal.

It is most advisable in the great majority of cases that the thorough examination be made under anesthesia. When the vagina is present but the uterus absent, there is no indication for treatment. When the vagina is absent as well, the matter of operation depends upon the individual. A satisfactory vagina may be formed by utilizing Baldwin's operation, in which a loop of ileum is resected and still attached to its mesentery is pulled down into a cleft which is made between the bladder and rectum. It is not without material danger and should only be carried out in married women who are incapable of marital relations, or in those who contemplate marriage and in whom such would otherwise be impossible.

Uterus Bicornis Duplex. A patient, aged 42, who consulted S. F. Wiltsie,⁸ gave the following history: For three years she had severe backache low down in the sacral region; feels tired all of the time and is unable to do her usual housework; has a dragging sensa-

tion referred to the pelvis and complains of pain radiating to the inner side of the thighs and is very constipated. During several pregnancies, menstruation occurred regularly throughout.

The cervix seemed to be larger than normal. To the right of midline and retroverted into the pelvis was what he thought to be a normal-sized uterus and to the left a similar mass which was concluded to be either an ovarian cyst or an uterine fibroid with a pedicle. This tumor-like mass was apparently attached to the uterus low down toward the cervix and more fixed than the uterus on the right.

At operation he found two normal-sized multiparous uteri, both retroverted and resting on rectum. Each had a normal ovary, round ligament and tube. Both horns were well developed but no connection existed between them, the fundi being widely separated and only fused at about where the internal os should normally be and terminated in one cervix. The opposing surfaces of both horns were slightly flattened and for the absence of a round ligament, tube and ovary, each gave the appearance of a normal multiparous uterus. There was a strong dense band of adhesions beginning over the fundus of the bladder and firmly attached to the cervix just above where the two horns united and extended down onto the rectum. This undoubtedly explains the cause of failure of fusion of the Müllerian ducts during development. The technic was first the resection of both tubes so further pregnancy would be impossible, then the uteri were sutured together with chromic catgut, the retroversion corrected by the modified Gilliam method, and abdomen closed.

Double Lumen in Fallopian Tube. In a specimen from a patient with dislocated and adherent ovary, H. E. Metcalf⁹ discovered an interesting state of affairs. At the uterine end, the tube seems to be normal; but a swelling starts about half way to the fimbriæ, and for the rest of its length it is about twice the normal size. Sections in this enlarged portion show a complete double lumen, each one about the same size. Toward the uterine end the lumen is single, and gradually changes into

two by the formation of a partition as the ovary is approached. This condition persists for a short time, and then one of the lumina gradually becomes smaller, and as it does so draws away from the other or main open-

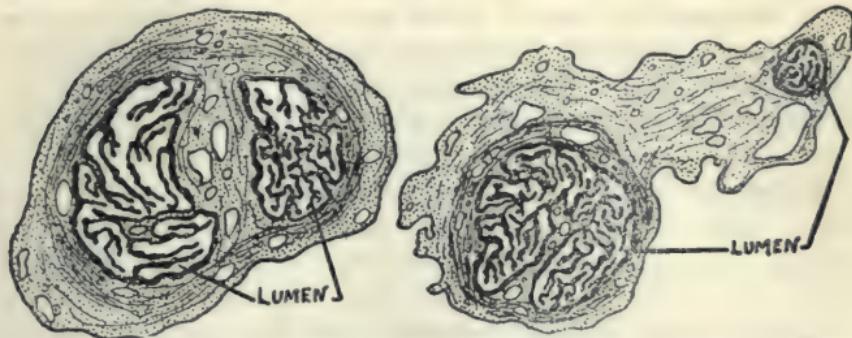


Fig. 10. Section of Fallopian tube midway between uterus and ovary.

Fig. 11. Same, near ovary showing main lumen and smaller one somewhat apart from the main duct (Metcalfe).

ing and ends in one of the fimbriæ some distance away from the main opening of the tube.

The explanation is somewhat difficult. In the middle part it may be explained by the adhesion of the two sides of the tube from continued trauma during several years; but this is not quite so clear in the distal portion, where the two openings are rather widely separated. It is quite probable, however, that the continued trauma due to displacement down behind the uterus for years had caused the union of the two sides of the lumen, and then further pressure caused the gradual increase in distance between the two lumina, thus causing them to open at rather widely separated points at the end of the tube.

Varicocele in the Female. In 1914, W. E. Darnall claimed this condition was not rare, but very common, in support of which he reported 10 cases. In a later paper,¹ he states he has operated on 20 more cases.

Pelvic varicocele or varicocele of the broad ligaments consists of a more or less permanent dilatation of the veins which make up the pampiniform plexus. It most often prevails in patients who have borne children. This is especially true if the perineal supports from below

have been impaired and there has been a sagging down of the pelvic organs. It may occasionally occur in single women with retroversion and who have been compelled to be on their feet a great deal. Varicocele is very frequently found accompanying diseased ovaries. It is more than likely that on account of the impaired circulation from venous stasis it is in many cases a cause of the pathologic states found in the ovary, rather than a result (Plate IV).

Tampons or a pessary may temporarily make the patient more comfortable by raising the level of the uterus and improving the return circulation. Surgery however, is the only cure. The veins are ligated at both ends and divided between the ligatures. Excision of the veins is necessary to prevent their restoration after the ligatures are absorbed.

Pathologic Report of Rotunda Hospital. This is furnished by R. J. Rowlette² and comprises 2 years instead of the usual annual summary. In this period 22 cases of malignant disease of the uterus were dealt with by operation—about their normal rate. Of these cases, 15 were epithelioma of the cervix, and 1 adeno-carcinoma of the cervix; 3 adeno-carcinoma of the body, 2 sarcoma of the body, and a chorion-epithelioma. The proportion of epithelioma is above their average, which for the previous nine years was 56 per cent. of the total.

Sixty-three cases of myoma were examined. In 26 secondary changes—other than fibrosis which is almost always present—had occurred. The conditions were: Grey necrosis, 12; red necrosis, 3; fatty, 1; mucoid, 1; edema, 1; cyst formation, 4; sarcoma, 1; calcification, 1; inflammation, 2.

Of the forty-eight cysts of the ovary, 4 were dermoids, 8 lutein cysts, 24 smooth-walled cystadenoma, and 13 papillary cysts. Of the last group—8 gave histologic evidence of malignancy. Three solid tumors of the ovary came under examination, 2 carcinomata, and a fibroma.

Adenomyoma of the Rectovaginal Septum. This is defined by T. S. Cullen³ as:

(2) Dublin Jour. Med. Sci., September, 1917.

(3) Johns Hopkins Hosp. Bull., November, 1917.

PLATE IV.



Section of cervix and broad ligament showing enlarged veins.—Darnall (see 107).

O. A., ovarian artery; *O. V.*, ovarian vein; *Ur.*, ureter; *U. A.*, uterine artery; *U. V.*, uterine vein.

"A diffuse growth consisting of non-striated muscle and fibrous tissue with large or small areas of mucosa identical with the mucosa of the body of the uterus scattered through it. This mucosa swells at the menstrual period and as there is usually no escape for the blood, the gland spaces tend to become cystic and are filled with blood; or there is hemorrhage into the matrix of the tumor. The tumor in the beginning is very small and starts in the vaginal wall just behind the cervix, or it may become recognized as a round or irregular thickening over 1 cm. in diameter, behind and usually attached to the cervix. The growth usually spreads in a diffuse and irregular manner, involves the adjacent anterior rectal wall, until, finally everything in the pelvis may be firmly glued into one mass."

The symptoms naturally depend on the manner of extension of the tumor. There is little trouble when of small size. There may be pain or not when extension to the rectum takes place. Severe neuralgic pain will ensue when the mass involves the pelvic nerves. Moreover, when the ureters are compressed by the tumor, there may be hydroureter on one or both sides, together with pressure symptoms referred to the renal region during menstruation.

In some instances there is much pain during menstruation. Where the mucosa of the tumor projects into the vagina, there will be an escape of blood from the posterior wall of the vagina at the menstrual epoch. In one of Cullen's patients this occurred, though hysterectomy had been done two years previous. When the adenomyoma extends into the rectum, of course, there will be some passage of blood from the bowel at the catamenial period.

Details are given of 4 cases, the respective ages were 28, 37, 27 and 43, showing the usual tendency to occur during menstrual life. While nothing positive is known as to the origin of these growths, it is certain the glandular elements are the same as those in the body of uterus.

A. H. Curtis⁴ has had 2 cases, one still under observation. The other in a patient, of 47 years, with a history of menorrhagia for many years, bearing down distress, and constipation. Upon examination were found a congenital ring in the vagina, and a large uterus fixed

in retroversion. In addition a polyp-like, bean-sized nodule projected downward, evidently from the cervix, into the cellular tissues of the posterior cul-de-sac.

She was operated upon in the East, and returned in most excellent condition, minus the bleeding fundus but still possessed of the small nodule. This mass, examined every few months, remained unaltered until a year previous. Then began a slow growth, with gradually increasing rectal distress during the next 6 months. Now development became more rapid and in two months' time the tumor doubled in size, and burst through the vaginal wall into the posterior fornix. There was associated vaginal bleeding.

The cervix, with the tumor mass and invaded tissues, was removed. The growth was adherent to the rectal wall but did not invade it. Recovery was prompt and complete. Study of the specimen shows no discernible demarcation between the cervix and the tumor.

Fibroids of the Vulva. In a report of 12 cases with a digest of the literature, V. N. Leonard⁵ observes that but 6 examples have appeared in 23,000 gynecologic cases at Johns Hopkins. The tumor usually appears first as a small, firm, painless nodule immediately beneath the skin of labium majus. Its growth may be extraordinarily rapid, and the tumor usually soon becomes pedunculated. Fibromata in the extraperitoneal portion of the round ligament have led to the most frequent mistakes in diagnosis. A tumor appearing in this region has often been mistaken for an inguinal hernia, and in some instances the patient has worn a truss until the increase in size demanded intervention. This is perhaps not surprising, for a tumor may appear very much like a hernia and even be reducible through the inguinal canal. In addition there may actually be a hernia in association with the tumor of the round ligament. Ordinarily these tumors cause no symptoms, other than the inconvenience from their size and weight and, if pedunculated, by their chafing and interference with locomotion.

Leonard has arranged the cases in what seems to be the order of frequency:

**I. Originating in the Subcutaneous Connective Tissue;
70 cases:**

- (a) of the labium majus; 53 cases.
- (b) of the labium minus; 11 cases.
- (c) of the vestibule and vagina; 5 cases.
- (d) of the perineum; 1 case.

II. Originating in the Extraperitoneal Portion of the Round Ligament; 39 cases:

- (a) growing outward into the labium majus; 25 cases.
- (b) remaining in the inguinal canal; 11 cases.
- (c) growing back into the abdomen; 2 cases.
- (d) growing up between the layers of the abdominal wall; 1 case.

**III. Originating in the Subperitoneal Connective Tissue
and Appearing at the Vulva; 14 cases.**

**IV. Originating in the Connective Tissue of Bartholin's
Gland; 4 cases.**

V. Originating in Hematomata; 2 cases.

VI. Originating in the Rectovaginal Septum; 2 cases.

The subperitoneal fibromata, which take origin in the pelvic connective tissue and, growing along lines of least resistance, first appear at the vulva, are the largest tumors on record. The largest ever described (268 lbs.) was of this type. Excluding the subperitoneal group, it may be said that, roughly, two-thirds of the fibroids of the vulva originate in the subcutaneous connective tissue and one-third in the extraperitoneal portion of the round ligament, *while nearly one-fifth of them become sarcomatous*. The vascular changes accompanying menstruation and pregnancy are shared by these tumors and exert a marked influence upon them, as is clearly shown by their swelling and sensitiveness under these circumstances. Herein lies the explanation of the fact that, almost without exception, they occur in the child-bearing period, grow rapidly, and usually show degenerative changes.

Primary Melanosarcoma of Labium Majus, With Cerebral Metastases. The patient under the care of A. Kotzareff⁶ was 56 years old. The tumor was on left side. Primary melanosarcomata of the external genitals, he writes, are very rare, and they are the most malignant of all neoplasms. The nervous system is rarely the site of metastases which generally locate in organs of mesodermic origin. The probable starting

point here was a pigmented mole, for the woman had many such on the external genitals, trunk and face.

For some 4 months the tumor developed slowly, then there was involvement of regional lymph nodes. A short time before death metastases took place into left lung, left side of brain and the spinal column, mostly to brain. Soon after admission she developed paralysis, and nothing was done save ligation of the vulvar growth to lessen bleeding. (Application of radium was refused.) Death 11 weeks after entrance.

Vaginal Metastases of Hypernephroma. George Gellhorn^{6a} had under observation, a patient aged 54, with a large retroperitoneal tumor on the left side whose nature could not be determined. Vaginal examination revealed the presence of two growths in the anterior vaginal wall near the introitus. These were of the size and shape of raspberries and easily shelled out with the finger-nail. Microscopic examination showed typical hypernephroma. It was then assumed the vaginal growths were metastases of the obscure retroperitoneal tumor and that the latter was a hypernephroma of the kidney. The patient died suddenly a few days later and autopsy fully confirmed the diagnosis.

Vaginal metastases of hypernephroma are extremely rare. Literature contains but 9 other instances of this kind. It is, however, probable that many cases of primary sarcoma of the vagina are in reality hypernephromatous and secondary to a malignant tumor of the kidney.

In view of the multiplicity of metastasation in the various parts of the body the rarity of vaginal metastases is doubly remarkable. Graefenberg endeavors to explain this phenomenon. He says particles of the tumor usually enter the vena cava through the renal vein; thence they are carried through the heart into the pulmonary arteries. This, however, explains merely the frequency of metastasis in the lungs. According to Sutter's investigations, retrograde metastases of malignant kidney tumors may at times be disseminated throughout the entire genito-urinary apparatus via the vena spermatica. This possibility seems plausible in

cases in which metastases are found in the ovaries, uterus and upper vagina for these localities are exposed to retrograde transportation of tumor particles by way of the spermatic vein through anastomoses with the plexus pampiniformis. This explanation, says Graefenberg, is, however, not sufficient for metastases in the lower vagina and vulva. Tumor particles from the kidney can reach the vulva by way of the spermatic vein only if there is an anastomosis of the plexus pampiniformis with the obturator vein. Such an anastomosis exists at times. The obturator vein, again, receives rami pubici from the external genitals, and thus a direct communication from the renal vein to the vulva is established. Since the left spermatic vein empties into the left renal, such a retrograde transportation of tumor particles to the external genitals seems more likely on this side than on the other because, under ordinary circumstances, the right spermatic vein does not empty into the renal but directly into the cava.

Graefenberg's contentions are borne out by the studies of Kownatzki on the distribution of veins in the pelvis. Kownatzki depicts an old parametritis which has led to an anastomosis between the plexus pampiniformis and the obturator vein. He furthermore shows in his dissections that even without such an anomaly the pubic veins carry blood from the external genitals directly into the so-called median iliac vein which by means of the uterine veins is connected with the spermatic vein and thus with the renal.

The theoretical explanation of Graefenberg is supported by the fact that of the 10 hypernephromata here collected, 7 were on the left side. In 1 the location was not stated. The preponderance of hypernephroma on the side does not seem accidental.

Mixed Tumor of Ovary. A patient, whose case is related by G. F. Dick,⁷ had been sick 3 weeks. The onset was sudden with pain in the back. No chill, fever, or vomiting. The pain extended bilaterally down the back and into hips. It was dull at first but grew gradually worse. The heart was slightly enlarged but there were no diagnostic symptoms. The roentgenogram

for kidney-stones was negative. The patient was in the hospital 3 months, then died. About three weeks before death a number of tumors appeared, one in the shoulder and two on the side of the chest. A pelvic tumor was found.

On post-mortem examination the right ovary was not affected; the left ovary was replaced with tumor tissue, but was not enlarged. The uterus was filled with masses varying in size from that of a pin head to a hickory nut. The tumor had spread by the lymphatics, involving the glands along the iliac vessels and the aorta so the tissues around the aorta and the adrenals were embedded in tumor tissue. The posterior and anterior mediastinum were filled with tumor tissue. The pericardial cavity had been invaded and was filled with bloody fluid. The tumor extended into the cavity of the heart. After it reached the heart metastasis took place by the blood-stream, and bony tumors were found. Tumors were found beneath the impacted mucosa of the stomach. The histology was that of typical sarcoma and carcinoma.

Perforation of the Vagina By a Papillary Cyst of the Ovary. H. Grad^s states papillary cystomas of the ovary are infrequent, and perforation of a hollow viscus by such a tumor, judging by the literature is very rare.

His patient was 35, O-para and no miscarriages. The chief complaint was a bloody discharge for the previous 6 months, at first only after a douche or coitus, later continuous; never profuse, but a more or less constant straining. Dragging sensation in pelvic region with occasional shooting pains in lower abdomen. On examination the entire vagina was found filled with a soft, pultaceous mass, bleeding freely. She was sent to hospital with a tentative diagnosis of carcinoma of the cervix. Further examination on arrival showed the cervix was not the seat, in the knee-chest position it was found the growth sprang from the cul-de-sac. Bimanually a pelvic tumor was distinguished, extending toward the left of the uterus also involving the ovary, connection with the tumor in the vagina was not suspected till the operation.

During the removal of the cauliflower mass per vaginam, the curette slipped into the pelvis and a large quantity of serous fluid escaped. The vaginal vault was thoroughly cauterized and the abdomen opened. Peritoneum, especially of the pelvis studded with papillomatous masses. Both tubes, both ovaries, uterus and cervix removed in one mass. Vault of vagina sutured with catgut and abdomen closed without drainage. Considerable shock, otherwise uneventful recovery. Abdominal incision healed by primary union, vaginal by granulation. No recurrence at time of report.

Bilateral Twisted Ovarian Tumors. On opening the abdomen to deal with, as he thought, a twisted ovarian tumor, J. Armstrong⁹ was surprised to find the condition was bilateral, there being an ovarian tumor the size of a fetal head on the left side, and one somewhat larger on the right. As the patient had been ill about a fortnight, both were almost gangrenous and adherent to everything round about. With patience both were isolated and removed, and as the appendix was closely adherent to the tumor of the right side, it also was removed.

Ovarian Cyst Causing Torsion of Fallopian Tube. This case, reported by J. W. Holland,¹ occurred in a girl of 18. There had been pain, nausea, etc., several weeks previous, but the attack followed a game of basketball. The diagnosis was acute appendicitis in subsiding stage; though acute inflammation of adnexa was considered. At operation a mass could be felt in the right pelvis, freely movable; no adhesions. This was found to consist of a small parovarian cyst, which had become rotated from left to right around the tube. The torsion involved the mesosalpinx and tube external to the mesovarium. The ovarian vessels were not involved. The tube and cyst distal to the twist were pearly-black. The tube was much swollen, very dense, and leathery. The cyst very tense. The ovary was somewhat enlarged and contained many small cysts. The right tube, cyst, and ovary were removed. The proximal end of round

(9) British Med. Jour., Jan. 19, 1918.

(1) Southern Med. Jour., August, 1917.

ligament was sutured to the right cornu of uterus. The patient made an uneventful recovery.

An Unusually Large Hydrosalpinx. An unmarried patient, aged 26, operated on by L. E. Phaneuf,² had a large, oblong, cystic mass, free in the abdominal cavity, signs of fluid on percussion. This mass fills the right lower quadrant and extends above umbilicus; can be moved from right to left, feels symmetrical, and is resili-ent. Examination otherwise negative. *Vaginal Examination*—Outlet slightly relaxed, no sign of infection of urethra or vulvo-vaginal glands; cervix nulliparous, in good position. Uterus normal in size, in position, freely movable. Small mass the size of orange in the right pelvis, none in left. The large mass is out of the pelvis, and may be moved from side to side, and up and down. No marked tenderness on examination. *Pre-operative Diagnosis*—Ovarian cyst with twisted pedicle.

At operation, however, it was found to be tuberculous salpingitis. Double salpingo-oophorectomy, fixation of uterus. Right tube and ovary weighed 3 lbs., left, 10 1/2 oz. Last report, 14 months later—well, no pain since.

Torsion of a Tubal Fibroma. Herde³ has been able to find but 20 cases of this nature, and most of them were fibromyomas. In a patient in Labhardt's clinic, aged 24, about 4 months after parturition, there was a sudden attack of pain, vomiting and slight fever, the attendant sent her in as a case of appendicitis or acute colitis. After examination the diagnosis halted between a tubo-ovarian tumor and torsion of a hydrosalpinx. At operation, however, a fibroma of the abdominal end of the right tube was discovered, apparently the first on record; in addition, the pedicle was twisted. The structure was a pure fibroma. Primary union and uneventful healing.

Primary Malignant Neoplasm of Fallopian Tube. In a 20-year-old patient referred to by C. Jacobson and H. G. Wells,⁴ the history, symptoms, and physical findings suggested ectopic pregnancy and considered as such without question at operation. Four weeks after she

(2) Boston Med. and Surg. Jour., Dec. 20, 1917.

(3) Corr. Bl. f. Schw. Aerzte, May 25, 1918.

(4) Surg., Gynecol. and Obstet., December, 1917.

died of hemorrhage and sepsis, with a pelvic abscess perforating the sigmoid and opening into the vagina, and thrombosis of the iliac and renal veins. At necropsy the wall of the abscess was found to be made up of extremely soft neoplastic tissue of peculiar polymorphous cells, and encapsulated nodules of similar structure were found on the peritoneal surfaces, both parietal and intestinal, and invading the left Fallopian tube. There were no metastases in the lymph-glands nor in remote organs. Grossly the isolated nodules did not suggest syncytoma, being encapsulated and pale, and not of the soft, ragged, intensely hemorrhagic nature, variegated in color, generally characterizing this neoplasm. The pelvic growth was so much altered by infection that its characteristics had little significance. The rapidly destructive growth is evidenced by the erosions into the sigmoid and into blood-vessels causing hemorrhages which almost exsanguinated the patient.

This tumor does not seem to possess the characteristics of carcinomatous neoplasms, especially those of the tubes, but rather resembles the atypical chorio-epitheliomata, the large epithelial cells being syncytial cells, in some places uniting to form small masses. No typical Langhans' cells were found. On the basis of the history, and findings, they consider that in all probability the neoplasm arose in the decidua of an ectopic gestation, although the histologic findings alone do not prove positively that it is a decidioma.

Primary Echinococcus Cyst of the Uterus. A. Turenne⁵ started to excise a supposed myoma in the uterus of a patient of 47. As the tumor was seized with forceps, it tore and a gush of fluid startled the surgeon as he feared he had blundered into overlooking a pregnancy. There was nothing to be done then but remove the uterus by subtotal amputation. In Argentina where echinococcus disease is so common, he has been able to learn of but one other case of a primary hydatid of the uterus. In the literature Turenne found records of 10 others. In his case the cyst had probably been present during the last pregnancy (Plate V).

(5) Surg., Gynecol. and Obstet., April, 1918.

Uterine Tumor in New-Born. A girl-baby, 11 hours old, seen by E. M. Prince⁶ had a large hernia covered only by the peritoneum, the left rectus being but partly developed. In addition, there was a large tumor which was thought to be hydronephrosis.

At operation it proved to be a cystic tumor of the uterus, nearly filling the abdomen. The right tube and ovary were missing. A blind tube led from the cornu out into abdomen for about an inch. A large quantity of mucopurulent material was evacuated. The uterus then contracted to the size of a large marble, leaving room for replacing the intestine. An examination of the endometrium showed it to be normal. The incision in the uterus was then closed, abdomen also, uninterrupted recovery. Fearing the uterus would again become distended, Prince pulled the cervix down into view through the vagina. Forceps were inserted through the cervical canal into the organ to promote drainage.

Retroperitoneal Cyst of Wolffian Origin. This case, recorded by J. M. Maury,⁷ concerned a patient, of 28, who for 18 months had frequent micturition, the bladder being emptied every hour or two both day and night. She came to hospital on account of an enlargement which was first noticed in left lower abdominal zone a year previous, and has continued to increase in size. The abdomen is filled with a globular, fluctuating tumor from pubes to costal margins. There is central dulness and dulness over the left side of tumor; a tympanitic note above and to the right side. In her first labor the perineum was torn into rectum with inability to control flatus and liquid stools. Cervix normal; uterus normal and anterior to the tumor which could be felt per vaginam. The preoperative diagnosis was proliferous cyst, probably springing from left ovary, with complete laceration.

The perineum was repaired. A median incision revealed that both ovaries were normal, and showed a smooth, glistening, thin walled cyst having its origin posteriorly to the peritoneum. The whole lumbar gutter was filled with the cyst from up on the lateral ab-

(6) Jour. Amer. Med. Ass'n., April 27, 1918.
(7) Surg., Gynecol. and Obstet., June, 1918.

dominal wall to the spine, and from above the kidney to the promontory. There was no pedicle. The colon descended to its outer side. Enucleation was rapid and easy, care being taken to avoid the vessels going to the colon, and it was soon seen the cyst had no connection with any organ. When enucleation was nearly complete it was ruptured, discharging a thin, watery fluid. In the enucleation a structure was encountered, thought to be the ureter. However, it lost itself in the cyst wall and did not go into the pelvis at the right place. Cutting this across revealed a tubular structure. Dissecting out the distal portion showed it to go under sigmoid and ending in broad ligament halfway between uterus and pelvic wall. There was left after removal of the tumor a large denuded area which was drained from behind and covered in front by suturing the peritoneum over it. Convalescence was normal.

In this case, a tube larger than a ureter, communicating directly with the cavity of the cyst, running down, passing under sigmoid and terminating in the region of the normal parovarium could certainly be nothing other than the Wolffian duct.

Fatty Tumors of the Uterus. While very interesting from a histogenetic standpoint, these growths are of little clinical importance owing to their rarity. Placing a case on record, Elkin and Haythorn⁸ point out that fat cells are differentiated from mesenchymal cells, and are neither fibroblasts nor derived from fibroblasts. As no fat cells occur in the uterus, a true lipoma must be formed from embryonic displacements of such cells.

"The difficulty lies in our inability to say that the large fat cells were not derived from connective tissue cells. The fibrogen fibrils, which are the only definite means of identifying connective tissue cells, could not be demonstrated in connection with fat cells, and aside from the globular fat contents we know of no characteristic structures by which to identify a fat cell, so that we could not be sure that after all we were dealing with true fat cells."

They finally conclude the mass in their case was a lipoblastoma.

(8) Surg., Gynecol. and Obstet., July, 1917.

Case of Pure Myoma With Rapid Development. A patient, of 31, since the birth of her third child, 2 years previous, had menorrhagia which increased, despite various measures faithfully carried out. She consulted an "eminent accoucheur," who said there was no evidence of any tumor. Nevertheless, when seen by A. Siredey,⁹ 8 weeks later, a fibroma the size of a fist could be felt in the posterior cul-de-sac, as well as through the abdomen. The patient was very anemic, there was interference with defecation, frequent micturition with some dysuria. It was impossible to enucleate the growth, hence total hysterectomy was done. On cutting into the growth, instead of the large isolated fibrous masses usually seen, there was a multitude of round nodules, none larger than a pea. Histologic examination showed it to be a pure myoma. The rapid development seemed to presage a myosarcoma, but it is 6 years since operation, and the woman is in good health.

Fibrosis Uteri. W. B. Russ and H. T. Wilson¹ state the pathologic processes underlying the cases of menorrhagia and metrorrhagia caused by cancer, fibroids, polyps, inflammatory changes in the uterus and adnexa, certain constitutional diseases are fairly definite and well understood. But there are cases of menorrhagia and metrorrhagia in which no recognizable anatomic changes to account for the hemorrhage can be found. These cases have been classified as "Fibrosis Uteri." *I.e.*, a diffuse development of fibrous tissue throughout the uterus without a tendency toward circumscribed fibromata. This is also designated arteriosclerosis. These cases are most frequent in multiparae about the menopause. They are, however, by no means infrequent in nulliparae and those far below the climacteric age.

The treatment should be conservative as long as roentgenization or thyroid therapy show an encouraging effect. When these fail hysterectomy is indicated. In defense of trying roentgenization and organotherapy first, it should be said that a satisfactory and convincing trial of either requires such a short time as to render this a negligible factor when weighing the dangers of

(9) Bull. de l'Acad. de Méd., April 23, 1918.
(1) Texas State Jour. Med., February, 1918.

PLATE V.



Primary echinococcus cyst of the uterus.—Turenne (see p. 117).

delay against the possibility of cure without operation. The advantages of hysterectomy are, that whether or not we remove the primary disease by this means, we do remove a constant source of blood loss with its consequent effects, and in addition a symptom which has a very deleterious effect upon the nervous system.

One Hundred and Ten Cases of Fibroids. The very earliest symptom—and F. D. Reese² wishes to emphasize this one—is painful menstruation from the very beginning. The girl is in pain at the first menstrual period; the mother is called, hot applications are made to feet and abdomen, and the thing is forgotten until it occurs again. This history can be elicited in more than 90 per cent. of the patients who have developed fibroid tumors, if history taking is practised in all cases. This must be practised, for it is the stage in which abnormal growths can be prevented, and prevention is of more importance than even a late cure. Pain, bearing down, or a feeling of weight in the back or pelvis, a changed odor to the scanty leukorrhea, blood discharge in the intervals between menstruation; also a profuse flow which is quite noticeable at the regular period. If one gets this history and these symptoms, it will be high time that the woman is examined. The symptom was elicited in 106 cases in this series.

In three instances, patients of 64, 38 and 30, respectively, malignancy was present.

Diagnosis, Complications and Treatment of Fibroids. From performance of 150 operations for these growths, W. D. Macfarlane³ has arrived at the following conclusions:

They are rare under 30 years, and frequent over that age. The youngest patient (13) was seen by Cavaillon.

All fibroid tumors require to be carefully watched, as they may become a source of danger. The menopause does not necessarily bring about a cure; as the patient grows older these growths constitute an increasing danger. The risk of malignant new growth arising in a

{2} Med. Record, Feb. 16, 1918.

{3} Glasgow Med. Jour., November, 1917.

fibroid before 40 is not great; after that the danger increases with each year.

When these tumors produce symptoms sufficient to cause the patient to consult her attendant surgical treatment is indicated, or deep-seated therapy by *x*-rays. Palliative treatment is very generally unsatisfactory. Many of the cases operated on by Macfarlane had been subjected to long periods of medical treatment and invalidism, and were finally forced to have surgical relief. In properly selected cases *x*-rays give good results. Small uncomplicated fibroids do not require treatment, but should be medically supervised regularly.

Uterine fibroids predispose to sterility, but do not prevent conception. If a patient is known to have had fibroids prior to pregnancy careful examination should be made at least a month before labor is expected; after delivery the third stage must be carefully watched for a severe post-partum hemorrhage; the puerperium must be supervised with care, as possible infection or degeneration of the tumor may occur. Many pregnant women with uterine fibroids have a perfectly normal labor. Atrophy of the fibroid occasionally occurs after the pregnancy and puerperium are completed; it is, however, rare.

Fibroids in the Young. The chief object of a paper by E. L. Beck⁴ is to substantiate his contention that fibroids are entirely more frequent in the young than heretofore considered. Details are given of cases in patients of 24, 21, 22, and 18, respectively.

Remarks on Fibroids. A communication by E. J. Ill⁵ is based on 529 operations. His experience was that the presence of a fibroid, the diagnosis being certain, was rarely an indication for operation. However, it was sometimes advisable to operate if the patient became depressed because of knowledge of the presence of the growth. A doubtful diagnosis should always be cleared up by whatever means were at one's disposal. Rapidly growing tumors should be removed. Some cases he had watched closely for years, but had never seen a malignant degeneration. He had seen sarcoma develop

(4) Jour. Arkansas Med. Soc., July, 1917.
(5) Med. Record, June 1, 1918.

beside a fibroid but never in the tumor itself. A combination of fibroid and cancer was rather frequent, but not surprising in view of the frequency of both these conditions.

The most frequent indication for intervention was pain, which occurred in 36 per cent. of his series, while hemorrhage was recorded in 35 per cent. Here came in the question as to what degree of hemorrhage would warrant operation. A combination of pain and hemorrhage occurred in 13 per cent., which went to show that more had wished relief from pain than from hemorrhage. A most pressing indication for operation was symptoms of sepsis. Operation in the presence of septic adnexal disease was debatable. Sterility might be an indication, but should never be undertaken except for single tumors. Dystocia due to fibroid had been the cause of but one operation.

Ill had performed operations by the vaginal route for tumors reaching to the navel. Today vaginal extirpation should not be done if the uterus could not be pushed up into pelvis, and the cervix brought to the vulva. Abdominal supravaginal amputation would be the choice in most cases. This was the operation performed in 331 cases. Abdominal total extirpation was done 14 times; total myomectomy 14 times. In 13 he did a myomectomy and Gilliam on the same patient. All his myomectomies recovered. He did a curettage 13 times but this was fraught with danger, and should rarely be resorted to. He had made it a practice to conserve one or both ovaries. In the first 100 he had seven deaths, in the second 100 he had had no deaths, and in two series of 69 cases each he had had no deaths.

Myomectomy or Hysterectomy. In the treatment of uterine fibroids myomectomy has had a very limited application as compared with hysterectomy. The positive indications for the former have been a single tumor in a patient under 40 either pedunculated, or at least not deeply embedded in the uterus, and not giving rise to excessive bleeding. It is now, however, in most cases possible, and V. Bonney⁶ holds in many cases proper, to

carry out the conservative operation though all these criteria are traversed.

The drawbacks that have been urged against removing the tumors and leaving the uterus are: (1) that where the leading symptom is menorrhagia hemorrhage may continue after operation; (2) other tumors may arise either *de novo* or from overlooked seedlings; (3) the likelihood of pregnancy in the conserved uterus is small, and in the event of its happening the scar may give way; and, (4) that the operation is frequently more difficult than hysterectomy while its risk is at least as great and often greater.

There are, of course, certain cases in which the propriety of removing the uterus is in no doubt; elderly women with large and multiple tumors; cases where anemia is so extreme that any further loss of blood, even a normal menstrual period, is undesirable; inflamed or degenerate tumors, or large ones growing in the supravaginal cervix. But besides these there is a considerable class of relatively young patients who, having fibroids, seek advice on account of menorrhagia, dysmenorrhea, or abdomino-pelvic pain. It is in this type that myomectomy is artistry and hysterectomy crudity.

As a result of his experience he is convinced that the practice of myomectomy should be considerably extended. Bonney now frequently performs the conservative operation with complete success where a few years ago he should have removed the uterus. When the tumors are small or of moderate size, the proceeding can be carried out very well through a transverse incision across the pubic hair field. To send a woman back to daily life without blemish, cured of a serious disability and danger, is an achievement of high artistry.

Mesenteric Thrombosis Following Hysterectomy for Fibroids. Abdominal panhysterectomy and appendectomy were performed on Sept. 28 by M. Rabinovitz.⁷ The patient, aged 42, developed abdominal symptoms, and on Oct. 2 the abdomen was reopened. The peritoneal cavity was free from effusions. The stumps of broad ligaments and appendix presented normal healing surfaces. On the left side a coil of small intestine,

apparently jejunum, for a distance of about 9 inches, was purplish blue, distended to twice its normal size, with its corresponding mesentery hard and indurated. The rest of the intestinal tract was normal. No attempt to resect was made, owing to the precarious condition. The patient died four hours later.

At the operation no active inflammatory process existed anywhere. The pathologic conditions encountered were rather chronic and most likely due to pressure by the tumor upon the adjacent viscera. A primary focal infection can therefore be ruled out with a fair degree of certainty. The subsequent course, absence of temperature to any appreciable degree, absence of chills and rigors, and the slow pulse, with none of the typical abdominal crisis characteristic of mesenteric thrombosis further tend to eliminate the possibility of a septic phlebitis. Furthermore, the absence of peritoneal involvement, as evidenced by the clinical signs and the findings at reoperation, lend additional confirmatory evidence of a nonseptic origin. The conclusion must therefore be that the thrombosis was purely mechanical. The only clinical peg upon which to hang a diagnosis of mesenteric thrombosis in this case was persistent vomiting. Whether this sign alone can be relied upon to clinch the diagnosis of mesenteric thrombosis is rather a rash statement to make. This case teaches the lesson that postoperative vomiting alone persisting in spite of lavage and open bowels with a soft abdomen should be a sufficient indication for exploratory operation.

Complete Inversion of Uterus Due to Fibroid. Total abdominal hysterectomy was found necessary by J. E. Summers⁸ to relieve the condition. The patient, who was 50 years old, had been subject to severe hemorrhages and serious discharges for about 2 years previous. After an attack lasting a week, she was admitted with a diagnosis of extruded fibroid filling the vagina. When first seen by Summers this seemed correct, but on combined palpation he found the tumor filling the vagina consisted of the uterus itself plus the tumor which had a broad sessile base. In addition the inversion was complete, the cervix could not be distinguished.

Because of the unusual conditions presented, none of the vaginal operations recommended were practicable, and abdominal hysterectomy was done. After freeing

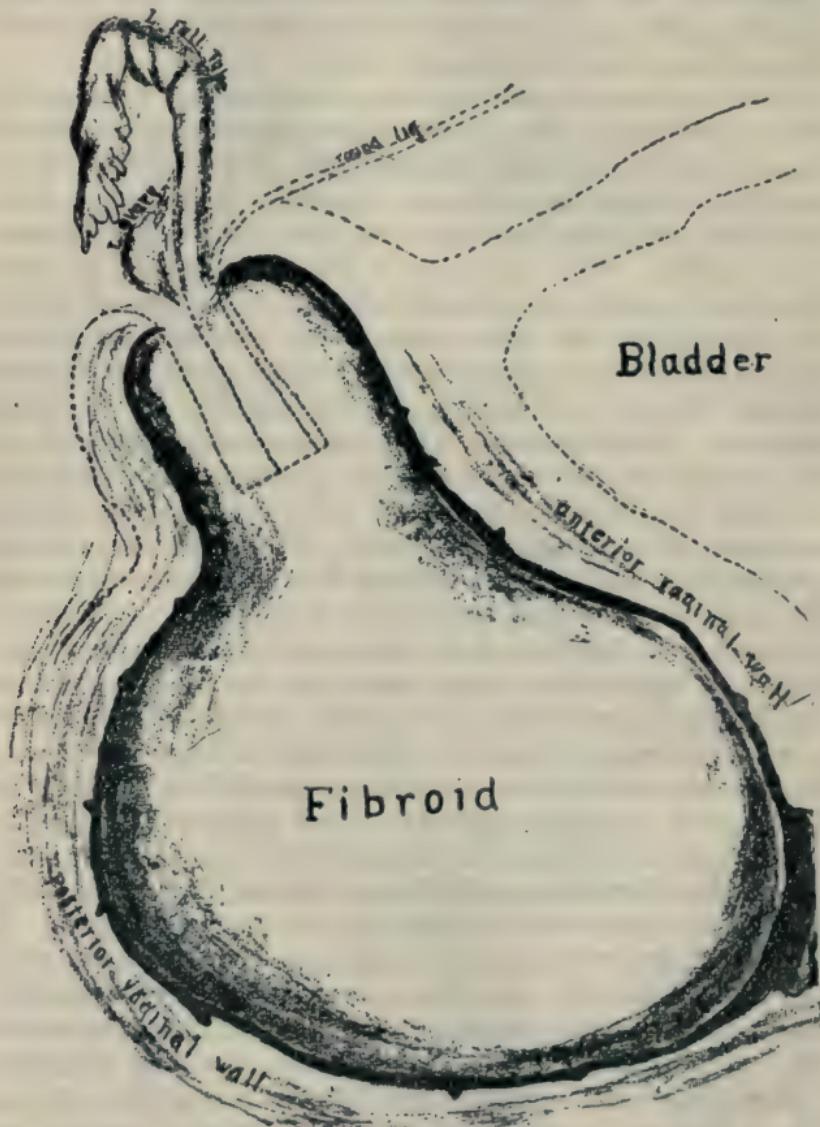


Fig. 12. Complete inversion of the uterus due to a sessile-based uterine fibroid. No cervical constricting ring (Summers modified from Kelly).

the uterus from above it was pushed out through the vagina, thus lessening the danger of peritoneal infection. Recovery after a stormy convalescence.

Gangrene of Uterus Following Torsion of Pedicle of Myoma. A patient, of 61 years, was examined 3 years previous by A. Stein,⁹ and found perfectly well. When next seen she had had a foul purulent discharge for 5 weeks. The uterus was somewhat enlarged, and after curettage, examination of the scrapings showed deep-seated multiple abscesses in the uterine wall. At the time of curettage very foul pus was evacuated. There was a rise in temperature to 103°, 104° and 105°, instead of a decrease. In the discharge, as one would have expected, there was an excessive increase, and then odor absolutely intolerable. A total extirpation was done.

The uterus *in situ* was large, deep, black and soft. It was opened after the hysterectomy and the whole wall up to the peritoneum was absolutely black. The gangrene had started from a little myoma and the entire uterus had become infected. The pelvic veins were free. Absolutely smooth recovery.

Sarcomatous Degeneration of Fibroids. Report is made by H. W. Mills¹ of two examples of this in patients of 68 and 48, respectively. The former died 5 months after hysterectomy, from general sarcomatous involvement of peritoneum. The younger woman, operated on Feb. 24, 1916, was examined Dec. 7, 1917, and found free of any evidence of recurrence (Plate VI).

The recent literature is not very voluminous, but Mills refers to the paper of Witter: In examination of 6,084 cases of pelvic pathology from Peterson's clinic (Ann Arbor), he found 21 cases of sarcoma, 18 of which resulted from the degeneration of uterine fibroids. He points out that this degeneration may occur: 1. By proliferation of the intermuscular connective tissue. 2. By proliferation of the connective tissue of the vessel walls. 3. By direct changes in the nonstriated muscle cells.

Of 100 consecutive cases of fibroids, F. Warner² found sarcoma twice and in 5 cases leiomyomata showed a

(9) Amer. Jour. of Obstet., June, 1918.

(1) Interstate Med. Jour., March, 1918.

(2) Amer. Jour. of Obstet., December, 1917.

strong disposition to sarcomatous change. Hence, he advises early removal.

Sarcoma Arising From the Endometrium. In his report, Leo Brady^{2a} observes that this case is interesting principally because it is an example of the importance of paying attention to any menstrual irregularity in patients of the cancerous age. Here we have a woman entering the hospital worried because of a lump in her breast which turns out to be, on operation, a benign tumor, but paying little attention to the recurrence of vaginal bleeding, one and a half years after the menopause, which scrapings demonstrated to be due to a very malignant growth.

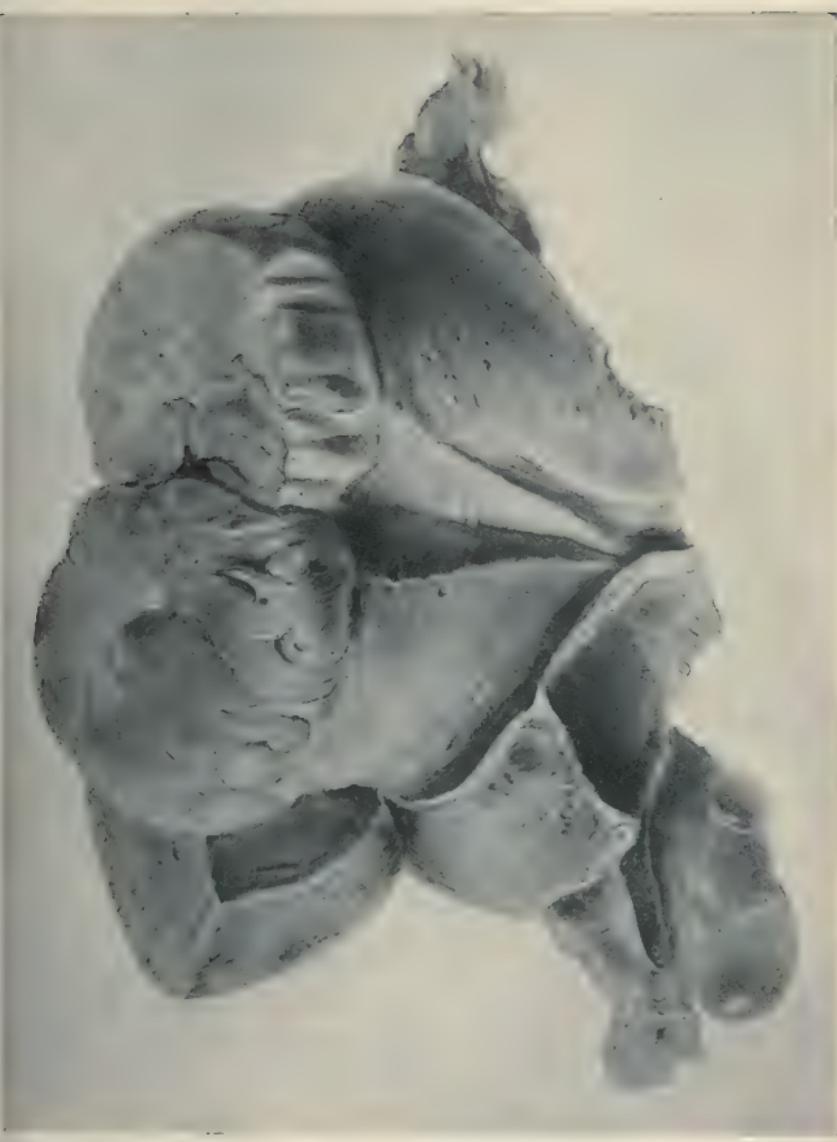
Finally, the case is interesting because we are apparently dealing, not with a sarcoma starting from malignant degeneration of a fibroma, as is usually the case, but arising from the connective tissue of the endometrium. Certainly we find no myomatous changes anywhere, and on examining the sections one cannot help but be struck by the fact that the tumor cells have arisen from the region where we find the remains of the uterine glands. Such tumors, while occasionally reported, are nevertheless quite rare.

The Predisposing Cause of Cancer in Women. G. E. McCullough^{2b} from the reading of much literature and some application in his limited personal observation emphasizes his conclusion that the large causative factor is from inherent "toxicity." Toxicity produced in the body through intestinal absorption, focal infective centers, etc., has already commanded the attention of the profession. That woman with her burden of specialized tissue (uterus and breast) is the special victim of toxicity, goes almost without the saying. Her greater tendency to constipation, her indoor life and more sedentary habits give this consideration significance.

That all well-organized tissues with full resistance to infection, their ability to meet trauma and recover, do become affected by toxic conditions is evidenced by articular rheumatism, etc. Yet we grope in the dark in

(2a) J. Hopkins Hosp. Bull., July, 1918.
(2b) Ohio State Med. Jour., July, 1918.

PLATE VI.



Sarcomatous degeneration of uterine fibroid: Case II.—Mills (see p. 127).

looking for an explanation of breast and womb disturbances. Such highly specialized tissues it appears would, of necessity, be the ones to suffer the effects of toxicity. Cell proliferation, as a result of activity, is always the resultant of some reaction. When reaction is attended with availability of normal food material, the new cells produced conform to the type of the parent cell. When they follow the action of assimilable material of abnormal constituents, the new cell types are variants of the parent cells. Hence, we are justified in concluding that cancer implant may occur in the female child during the pre-menstrual life, from neglected constipation and the mischievous error of ignoring centers of focal infection.

These centers thrust their burden of toxine into lymph channels, blood is impoverished, new cell growth is disturbed and abnormality of cell arrangement accentuated. The very forces that are active in the true cell development are held in check while the vicious cell arrangements are not throttled. Such a theory of cancer development needs no history of trauma. For we must admit that while it is quite the notion that laceration of cervices, malposition of the uterus, bruises and injuries of the breasts are causes of cancer, yet in nulliparas and in the absence of any breast injury, large numbers of such patients do have cancer.

As long as we accept microbial, traumatic or chemic changes as essential, so long do we entertain a hopeless interpretation of the cancer problem.

Face the fact that the better classes, the well-to-do, the northern people of brain efficiency are being afflicted more by the scourge, then the great attention paid to eugenics pales into insignificance by comparison, in the final results in race propagation.

There is a peculiar optimism in accepting carcinoma as a resultant of toxicity. It carries us back to first principles of living correctly; it gives a responsibility in preventive treatment, a privilege to teach hygiene for cause.

To accept the prevalence of carcinoma as a sign of the deterioration of human kind marks clearly the retro-

gression of cell life, due to too much coddling, too much of modern convenience, too easy transportation, *too much drugging*.

Such acceptance warns us to be alert, to insist on people eating less, living in the open, walking more, caring for the physical make-up rationally. Such acceptance prompts us to begin with children, little girls especially, in such hygienic training that their highly specialized tissues may be prepared later to withstand the assaults of toxicity.

The Surprises of Exploratory Curettage, and the Diagnosis of Cancer of the Uterus. M. Muret³ points out that the surprises are numerous and may be divided into: (A) The diagnosis of cancer has been made from examination of the scrapings, though the uterus shows no evidence of malignancy. (B) Exploratory curettage gives a positive result; the excised uterus, at first negative, after long and patient search, shows a few traces of carcinoma. (C) Positive curettage has not been followed by a radical operation, nevertheless the patient remains cured. (D) The curettage is negative, yet examination of the excised uterus reveals a carcinoma which had escaped the curette.

Details of 7 cases belonging to these categories are given, and after a study of them, Muret is of the opinion that curettage of the uterus as completely as possible, with a view to histologic examination later, is and remains the surest means of diagnosing carcinoma of the body of the uterus, even—and especially—in the beginning.

In extremely exceptional cases, the curette may remove the whole of a carcinoma when of slight extent (both in width and depth), such as is found early; or even a carcinomatous polypus, in which the base of the pedicle are not invaded. These unusual instances show the possibility of an apparent cure as the result of a positive curettage, though not followed by radical operation. Hence after the latter, the uterus may be found exempt from all trace of carcinoma, as proved by serial sections of the organ. There are also intermediate cases, where the uterus, though apparently

sound, still contains a few deposits of malignant growth, more or less difficult to discover.

Such exceptional cases, however favorable they may seem, do not preclude the possibility of metastases in other organs later on. In spite of their rarity, it is well to be aware of them, for they are not errors of diagnosis, but have been demonstrated scientifically. It follows that exploratory curettage with a positive result is always an indication for radical operation, even though other curettages should prove negative.

In other—and exceptional—cases, an epithelioma in the beginning and circumscribed may be so located it escapes a curettage even though very complete. Given a negative or doubtful result, but with suspicious clinical symptoms, the latter alone may justify operation.

In view of the above surprises, every curettage should be followed by a histologic examination carried out by some competent person.

Contraindications of Curettage. The curette is an instrument of diagnosis in securing material whereby we may differentiate between malignancy, endometritis, abortion and uterine polyps.

Positive contraindications to its employment, according to C. S. Barnes,⁴ are: Suspected pregnancy and obvious or probable systemic infection by way of the endometrium, especially streptococcal infection. The dangers ever to be kept in mind are: uterine perforation with intraperitoneal infection or the introduction of irritating fluid, accompanying hemorrhage, and probable visceral injury; and, particularly in acute conditions, the removal of a leukocytic barrier, opening a gateway to general infection.

Mixed Tumors of Uterus. In 2 patients, seen by G. W. Outerbridge⁵ there was simultaneous occurrence of carcinoma and sarcoma: (I) In a patient, aged 73, there was a submucous tumor, partly necrosed, which had apparently sprung from sarcomatous degeneration of a submucous myoma, with carcinoma of the overlying endometrium. (II) In a woman, of 48, a small though definite area of adenocarcinoma in the fundus

(4) Amer. Jour. of Obstet., June, 1918.

(5) Ibid., Vol. lxxv., 1917, p. 575.

was removed by curettage. Hysterectomy was subsequently performed, and examination of the specimen showed the site of the small carcinoma, though no further deposit could be discovered. In the posterior wall of uterus was a small nodule, which on microscopic examination proved to be a myoma with spots of sarcoma.

A series of 27 cases collected from the literature showed all grades from complete separation of the two growths (Case II) to intimate mixture (Case I). Even in the latter instance, the neoplasms have probably originated separately and then fused together. This association is somewhat rare, and while the malignancy is relatively that of sarcoma or carcinoma alone, metastases as well as recurrences show, as a rule, only sarcoma.

Myoma Associated With Carcinoma. At a meeting of the Section of Gynecology and Obstetrics (Royal Society of Medicine) H. R. Spencer^{5a} gave an account of two cases of myoma of the uterus treated by hysterectomy, in which cancer of the body was present. (I) A recurrent cancer in which the growth had invaded the peritoneum. The recurrent mass was removed, with the lower end of ureter and right half of the bladder. The kidney became infected subsequently and was removed. There was a second recurrence which was inoperable. Death 26 months after hysterectomy. (II) Here growth had advanced to within 1 mm. of the peritoneum. The patient was free from recurrence after 5 years.

The speaker was an advocate of total abdominal hysterectomy for myoma. He had never amputated a uterus for cancer of the body, whether complicated with myoma or not. Three experienced gynecologists, advocates for amputation for myoma, had overlooked cancer of the body as a complication, and performed amputation (or, in one case, incision before removal) in 14 out of 18 cases, and in no case was a five-year after-history given. Two of these three gynecologists had overlooked cancer of the body, uncomplicated with myoma, and performed amputation in 3 out of 12 cases, two of the three cases recurring. Advocates for amputation needed to take greater care than advocates of total hysterect-

omy in making the diagnosis of cancer of the body as a complication, and should clamp the uterus before dividing (with the cautery). Total abdominal hysterectomy by Doyen's method, the vagina being opened and severed with the galvano-cautery, was superior to amputation for myoma in lessening the risk from cancer of the body should it have been overlooked.

In the discussion, G. F. Blacker said he had seen only one cancer of the stump after the supravaginal operation. Most operators considered they did not get such a good result from total hysterectomy as from this operation, which was safer and simpler. The number of cases of cancer of the stump was so few that the danger from the more severe operation was greater than the possible chance of the occurrence of cancer. J. D. Malcolm said that he always removed the uterus completely except in simple fibroids. H. R. Andrews thought cancer of the body would not be overlooked if histories were taken very carefully. A distinct interval of amenorrhea, eight months to a year, occurring when periods had been profuse, was very suggestive of a new condition. Mr. Dinnick said if total hysterectomy were well done convalescence was easy and smooth, more so than in the supravaginal operation. There was no rise of temperature and less danger of sepsis. Lapthorn Smith always did total hysterectomy in suspicious cases.

Hysterectomy in Malignant Disease. When should we consider a case inoperable? R. D. Purefoy's opinion⁶ is that if there be a reasonable prospect of the patient surviving the operation even for a few months, the proceeding is justifiable, as it in most cases secures relief from foul discharge and to some extent mitigates pain. It may sometimes happen that the conditions present evidently involve too much immediate danger to justify further intervention, but the more experience one gains the fewer these cases will become. The usual preparatory treatment should be carefully carried out with the utmost care and gentleness, bearing in mind the risk of perforating the uterine wall. The use of radium sometimes brings about a truly marvellous improvement in the local conditions, making radical treat-

ment possible in cases apparently hopeless. Further, in some cases the risk of injury to the bladder may be diminished if we begin by thorough disinfection of the vaginal canal, and proceed with the first stage of vaginal hysterectomy, separating the bladder from the cervix and opening Douglas's space and placing therein a plug of iodoform gauze. The best mode of dealing with a severed ureter must always be an anxious problem. When the walls are thickened union of the ends must be well-nigh impossible. Venous hemorrhage in the broad ligaments is sometimes a very formidable source of risk and very difficult to deal with.

Carcinoma in the Stump, Following Suprapubic Hysterectomy. This does occur in a few cases, but E. A. Vander Veer⁷ states it is not a point in favor of a panhysterectomy exclusively. The dangers of a panhysterectomy are greater than the risk of a carcinoma occurring secondarily in the cervical stump and being properly treated. A careful examination should be made of every cervix before the hysterectomy is performed, particularly in parous women. In every hysterectomy the patient should be advised to report promptly if there is any appearance of a vaginal discharge, a curettage done, and histologic examination made. Removal of the cervix per vaginam is certainly to be preferred to opening the abdomen in every case where the disease has not progressed too far, as well as in any cases having any discharge. Routine pathologic examination of the myomatous uterus at the time of operation should be done, and in this way unsuspected cases of carcinoma will be discovered and the proper operation then performed.

End-Results of Operations for Uterine Carcinoma. These are contributed by F. Egli⁸ as part of the *Festschrift* for the semicentennial of the Obstetric-Gynecologic Clinic at Basel, now under the charge of Prof. Labhardt.

From 1900-10 the operability of 325 cases was 50.7 per cent., and 80 cases have been followed up; of these 33.75 per cent. had no recurrence for over five years. The vaginal route was chosen in the 14 cases involving

(7) Amer. Jour. of Obstet., Vol. lxxvi, 1917, p. 771.
(8) Corr. Bl. f. Schw. Aerzte, May 25, 1918.

the cervix, and in 12 of the 13 in which the fundus was affected. While the vaginal and abdominal operations were resorted to about equally in one whole series, only 1 patient operated on via the abdomen is known to have survived for more than five years.

HEAT, ELECTRICITY, RADIUM, AND ALLIED METHODS OF TREATMENT.

End-Result of Percy Cauterization. At a meeting of the N. Y. Academy of Medicine, J. A. Corseaden⁹ showed a specimen from necropsy 18 months later. The vagina was smooth and ended blindly in a small cauliflower mass which represented the former position of external os. A sagittal section of the uterus failed to reveal any cavity. The wall was quite hard, but contained a large quantity of muscle. A few drops of necrotic material could be squeezed from the cut surface. The rectum was quite difficult to open on account of the tortuosity of its lumen and the extreme constriction near the sigmoid. Incorporated in the pelvic mass were many serous cysts, some small, but several reached a diameter of 5 cm. Microscopic examination showed a typical epithelioma. The pelvic tissues about the uterus were also infiltrated. The neoplasm in the rectum was similar to that in uterus. The anatomic diagnosis was carcinoma of the cervix uteri, causing obstruction of the rectum, metastases, and multiple cysts of the peritoneum.

Opening the discussion, Holden asked Corseaden how he would treat such a case to-day in the light of what he now knew in regard to the *x*-ray and radium. Corseaden replied that he would employ radium. He knew of one patient doing her own housework two years after the first Percy, eighteen months after the second Percy, and a year after radium was first applied, a poor showing for the Percy and a fine result for the radium. The upper part of vagina was filled with scar tissue.

H. Grad said he had had 2 or 3 cases with fair results, but after all the Percy method was purely a palliative measure for extensive carcinoma of the cervix. If one

wanted to clean up a carcinoma prior to *x*-ray or radium it might have a field.

[The Percy method has not fulfilled its early promise.
—E. C. D.]

Radium in Uterine Tumors. F. E. Keene's opinion¹ is founded on analysis of 69 malignant growths of the cervix, vagina and urethra, and 47 cases of benign hemorrhage of myomatous or myopathic origin. In even fairly advanced carcinoma of the fundus, operation is the choice and radium should not be used. In early cervical cancer radical operation is to be advised. In the more advanced stages, which are questionably operable, radium is the procedure of choice. In such cases, if radium has produced an apparent cure, operation later with the idea of further eradication is inadvisable. The application of radium in the vaginal cuff immediately after radical operation may be followed by disastrous sequelæ. For the control of hemorrhage and foul discharge in cases beyond the operable stage, radium is by far the best means at our disposal. Even these cases may exhibit what is apparently a complete cure. In a certain percentage radium will have no effect on the growth or may actually stimulate it to more rapid extension. The majority, however, show a rapid destruction of the cancer area with local healing of the ulceration in over 40 per cent. The deeper extensions or metastases are little if at all affected; hemorrhage and discharge will be controlled but the advance will be unchecked.

Radium is the choice in all small, uncomplicated myomata, whose only symptom is hemorrhage. In these as well as in myopathic hemorrhage, 100 per cent. cure can be expected. In young women, radium should be used with the greatest caution, since it may be followed by a premature menopause. Irregular bleeding due to pelvic inflammatory disease, tumors of large size or of any size complicated by disease of the adnexa or surrounding structures, as well as myomata in young women, are to be treated by appropriate operation and not by radium. In no case of uterine bleeding should radium be used without a preliminary curettage and

(1) Pennsylvania Med. Jour., 1917, p. 469.

microscopic examination. In properly selected cases the convalescence is smooth and restoration to health complete. Pelvic pain rarely occurs and as a rule is of but a few days' duration. In the exceptional case profuse leukorrhea follows, but this is not permanent. Not infrequently radium has cured or diminished discharge which was present before its application.

Radium in Certain Types of Uterine Hemorrhage and Fibroids. After detailing his experience with a limited number of cases, C. J. Miller² observes it has been proved that radium possesses almost a specific effect in the control of certain types of persistent uterine hemorrhage. It possesses every advantage over *x*-ray treatment, in that it acts promptly, is free from the risk of cutaneous burns, easily applied, and acts by producing changes in the endometrium or uterus, rather than in the ovaries. It will reduce the size of probably 80 per cent., cause the disappearance of many fibroid tumors, and if carefully used, excessive menstruation may be reduced without causing amenorrhea.

Since such results may be obtained by a method that entails only one or two days' confinement to bed and causes only temporary discomfort amounting to little more than nausea or uterine colic, we must accept radium as a most valuable and necessary adjunct to gynecologic surgery.

Fibroid Tumors and Radium. Between March 23, 1913, and Jan. 12, 1918, Howard A. Kelly and C. F. Burnam³ treated 211 fibroids with radium. During the same period, 45 cases were operated on and not radiated. The average age of all the patients was 43 years, the oldest was 67, the youngest 26. Menorrhagia, metrorrhagia or both were symptoms in 161 cases, while in 50 bleeding was not a symptom.

Tumor gone or practically gone.....	87 cases
Tumor diminished	62 cases
Symptomatically well, no examination.....	14 cases
Unimproved (complicated).....	2 cases
Operation after radiation.....	8 cases
Died other causes.....	2 cases

(2) Surg., Gynecol. and Obstet., May, 1918.

(3) Virginia Med. Semi-Month., April, 1918.

Did not complete treatment.....	10 cases
No report	12 cases
Too early for results.....	14 cases
Total.....	211 cases

Putting aside the 38 cases with insufficient data, and the 6 which were complicated by other trouble, we have left only 4 cases in which radium was unsuccessful, in 2 operation was requested rather than further treatment, and in 2 the reduction of the fibroid was not rapid enough.

The technique is simple: A preliminary curettage; use of a polyp forceps to remove any pedunculated

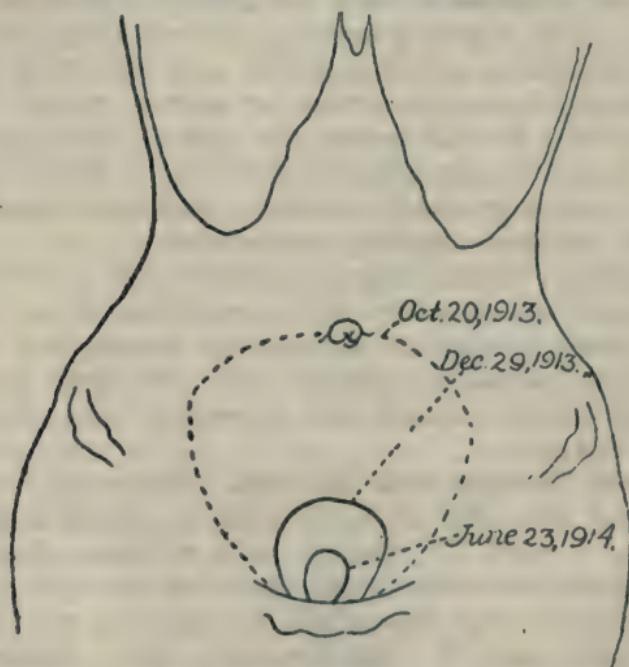


Fig. 13. Effects of radium (Kelly and Burnam).
Oct. 20, 1913, tumor reaching umbilicus.
Dec. 29, 1913, size of medium-sized orange.
June 23, 1914, still perhaps a small fibroid present but certainly nothing that can give any trouble.

growth; insertion of 300 to 500 millicuries of emanation covered with a rubber cot on the end of a sound into the uterus, and allowed to remain for about 3 hours. One treatment may be all necessary or a second may be required after several months. For this an external treatment may be substituted, one or more grams of

radium suitably filtered applied over various areas of the abdomen for several hours.

The inside treatment is no more painful than the introduction of a sound for any other purpose. The outside treatment is painless and in competent hands causes no irritation of the skin whatever. The immediate results are nausea for about 24 hours and abdominal tenderness for several days. Sometimes there is a leukorrheal discharge for a few weeks. These have been much less marked when large amounts of radium are used for comparatively short times.

From the foregoing cases they are clearly justified in concluding that radium is the treatment of choice in uncomplicated fibroid tumors. In the exceptional case, where radium may prove ineffective because of some unforeseen complication, an operation may be resorted to without any added difficulty on account of the previous radiation.

Treatment of Cancer With Radium. Since 1914, every patient admitted to the Maternity at Geneva (Switzerland) has, so M. Beuttner⁴ states, been treated by radium whether the growth was operable or not. Operations have been stopped, one result is that more patients are admitted as they do not have to fear an operation. The number thus far treated is 76. The results are probably much superior to those of the operative era, especially as the patients only need to stay a short time, and can then resume their usual life. He showed 4 women, in 3 of whom the cancers were operable.

In the discussion MM. Koenig and Guerdjikoff said they also were of the opinion that radium would enable operations to be dispensed with. M. Curchod asked if the applications of radium were not followed by disagreeable consequences.

Beuttner answered that the fever and gastrointestinal disturbances which were to be seen after each application of the radium were never serious.

[Among the most valuable parts of this volume are the abstracts on the use of radium.—E. C. D.]

(4) Corr. Bl. f. Schw. Aerzte, June 30, 1917.

One Hundred and Thirteen Cases of Cancer of Cervix Treated With Radium. This series is reported on by E. H. Risley and G. A. Leland, Jr.⁵ The average age of patients was 50, the youngest 30, the oldest 68.

First symptoms were reported as flowing in 84 cases, pain in 5, and amenorrhea in 1. Local signs were: Ulceration only, 3; sinus, 5; implantation on vaginal wall, 21; implantation on abdominal wall or in abdomen, 3; glandular metastases (at time of admission), 5; cervix nodular (plus other signs), 19; mass in vault, 24; ulcerated or necrotic mass, 35; crater, 25; extension to vaginal walls, 28; bleeding of greater or less degree, 42; extension to broad ligaments, 33; pelvic masses, 7; involvement of bladder, 6; involvement of rectum, 4; fixation of uterus or broad ligaments, 13 cases. Thus cases of all grades of severity were accepted for treatment.

In general the effects are as follows: temporary local benefit, 44 cases; much improved, 5; entire relief from pain, 5; some relief of pain in all but a few complaining of this symptom; complete relief from bleeding, 14; healing of ulceration, 11; decrease in size of the growth, 8; no improvement at all, 13; increase in the growth (some rapid), 30; fistula (vesico-vaginal) developed in 2; mass made more movable in 8 cases.

There were 2 deaths from disease other than carcinoma. The results remain unknown in 7 cases. The total mortality dated Feb. 1, 1917, is 62 cases. There are 21 cases still under treatment.

The radium has been applied: Per vaginam in 89 cases; per rectum in 1; over abdominal scar in 1; over inguinal glands in 2. The dose has averaged less than 1,000 millicurie hours.

Hemorrhage has been easier to control than pain because the superficial ulcerations are more readily affected than the deep extensions. The latter have been rarely improved and if so only temporarily. The healing of the vaginal disease is often accompanied by contraction of the vagina, which renders difficult satisfactory apposition of radium to the persisting deeper extensions. Long exposure with screening of the superficial

rays has been preferable to short exposures without screening, except in rare very superficial vaginal recurrent lesions.

The points of interest brought out in this analysis are, according to the authors, as follows: Much symptomatic relief can be expected from radium treatment, especially in the checking of hemorrhage and alleviation of pain. Prophylactic radiation immediately following hysterectomy is a safe and advisable procedure and should reduce recurrences. The treatment of early recurrences offers a fair prognosis. Late treatment offers little but alleviation of symptoms and but little retardation of growth. Inoperable cases are benefited by radium and life is somewhat prolonged. Radium should be given more extended and earlier trial in these cases. Every case operated on should be required to report once a month for the first year and once in three months for the second year and at frequent intervals for each succeeding year.

Radium Therapy in Uterine Cancer. W. S. Stone⁶ who is Asst. Director of Cancer Research at the N. Y. Memorial Hospital, regards radium treatment as of definite value in uterine cancer. It is peculiarly suitable and more effective for the arrest of the progress of the disease, as it is ordinarily presented to the clinician, than any other method hitherto employed. It is more effective in primary lesions than in recurrences. It will occasionally relieve pain in the terminal stages. It will relieve pain, stop hemorrhage and discharge, and restore the general health in a large number of advanced lesions more effectually than any other agent. It will convert borderland lesions into such as are plainly operable, and without surgery, will effect a disappearance of the gross evidences of the disease, and restore health in a large number of such lesions more effectually than surgery alone has hitherto been able to do.

Radium in Uterine Cancer. H. Bailey⁷ reports on his results in 120 cases. He finds the primary ones are more amenable to radium and the results are slightly better than where previous treatment had been insti-

(6) Amer. Jour. of Obstet., March, 1918.

(7) Surg., Gynecol. and Obstet., June, 1918.

tuted. Twenty-one per cent. of this class showed marked improvement with the possibility of remaining free from cancer.

When a period of two years passes, a fairly good estimate may be made as to ultimate results; it would seem

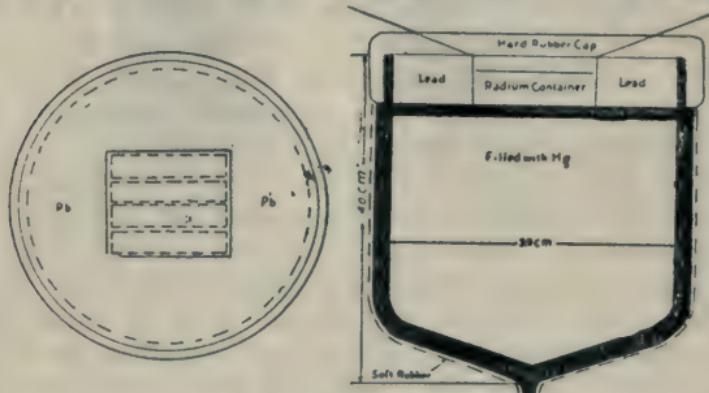


Fig. 14. Apparatus for radium therapy (Bailey). Present container, at left, top view; at right, section.

that not over 15 per cent. of his cases lived to that period, but in these the probabilities of a complete retrogression are great. On the other hand over 80 per cent.

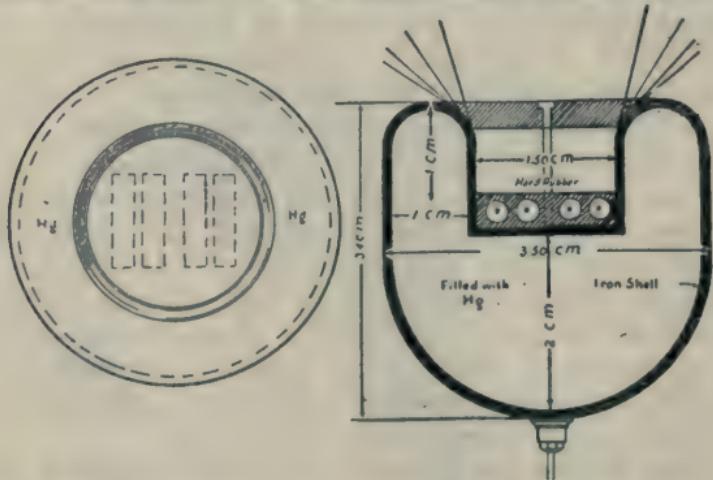


Fig. 15. Same. Container under construction, at left, top view; at right, section.

lived through the first 6 months, and nearly all show local improvement.

It is not easy to formulate any conclusions as regards

the actual treatments, but he is convinced that the inoperable cases do better without the Percy operation. Bailey believes the initial dose of radium should be high and it should seldom be repeated for the same area. Cross-firing should be made use of from within and from the surface. The filters on the sides and back of the applicators used in the vagina should be so effective that no harmful effect can result to the surrounding tissues; and as mercury reduces the ionization more than any other metal its use is advisable. Finally, the treatment should be completed as soon as possible, so the time of a second application will not coincide with the irritative effects of the first.

Radium in Cancer of the Female Organs. From experience in 100 cases, J. G. Clark⁸ concludes as a palliative remedy, radium is the treatment *par excellence* in inoperable cancers of the cervix. In border-line cases in which formerly he accepted the grave risks of an operation in the hope of eradicating the disease, he now employs radium, but in the certainly operable class still advocates a radical operation.

In cancer of the fundus, even when far advanced, he performs hysterectomy, resorting to radiotherapy only in the face of grave operative contraindications. As yet he claims no cures, but, based upon observation of several inoperable cases which have remained locally healed 1 to 3 years, hopes that the quinquennial test will find several survivors.

X-Ray Treatment. A. F. Tyler⁹ feels he is justified in recommending roentgentherapy in subserous or intramural fibroids. Also in postoperative carcinomata, in recurrent carcinomata, and in all inoperable carcinomata. The borderline between fibroid and malignancy is very narrow so we must be exceedingly careful not to take undue chances. Fibromyomata are prone to become sarcomata, thus where the fibroid does not yield to treatment surgery should be recommended.

Technic of Radium Treatment. In the intrauterine applications of radium, we have, says E. C. Samuel^{9a} to

(8) Surg., Gynecol. and Obstet., June, 1918.

(9) Nebraska State Med. Jour., December, 1917.

(9a) New Orleans Med. and Surg. Jour., August, 1918.

observe the same strict rules of asepsis that we do in any vaginal intervention, as the tubes come in contact with the endometrium, and, as we know, no infectious material should be carried in. Patients should be given a light cathartic the night before, and report early in the morning. An enema, followed by a lysol douche, is given. If nervous, a hypodermic of $\frac{1}{4}$ grain of morphia is given; this usually controls pain and nervousness after the tube has been inserted. The celluloid tube which contains the radium dosages is sealed with paraffin and put in 40 per cent. formalin for at least twenty minutes. A string attached to the tube by an eye, after the tube is inserted into the uterus, acts as an anchor, which is attached to the skin by a small strip of adhesive, also facilitating the withdrawal when the treatment is finished. It generally requires some little dilatation, which is easily accomplished with the Hegar graduated dilator, producing very little discomfort. Some patients complain most pitifully, and others do not, and in over 1000 applications given Samuel only required an anesthetic twice. The vagina is next packed with sterile gauze, to prevent the expelling of the tube if the patient is put to bed and not allowed to get up, and must use the bed-pan. Some complain a great deal of nausea, and others do not, so that one can never say exactly what is going to take place.

The usual exposure should last for twelve hours, using 50 milligrams of the element, which gives 600 milligram hours as a dose. The patient is requested to return in 7 days. This is repeated for three successive weeks, when a menstrual period is allowed to come in before resuming the treatment, and if the first treatment is given early after the last menstrual period, and the patient is over 35, we sometimes do not find a recurrence of the flow, and, if it does appear, it is usually diminished in amount.

After thorough examination by the referring physician the patient is allowed to rest for three or four weeks, and at the end of this time is examined again, when considerable reduction in the size of the tumor is generally noticed. Another series of treatments is given, of shorter duration—from six to eight hours—and

at the end of this time usually suffices. It takes from six to seven months for the tumor entirely to disappear, in some cases even longer, and in some instances menstruation has been stopped, with no appreciable effect on the tumor, but it does not seem to worry the patient very much.

Some patients complain, after radiation, of a thin, watery discharge. This is due to the action on the glands of the cervix and endometrium. This disagreeable symptom rapidly passes off, especially if the patient takes saline douches twice daily, as warm as she can stand it. He has not observed any other unpleasant symptoms in the large number treated up to the present time.

Radium is preferable to the *x*-ray, for radium destroys the endometrium, and the ray causes cessation of the ovarian activity, and the symptoms of the change of life are, therefore, very mild after radium treatment, whereas they are very much more pronounced after the Röntgen treatment, due to its action on the ovary. Another reason: the Röntgen ray requires more of the patients' time, they have to come for repeated radiation; radium only requires the desired number of hours.

[The use of radium in gynecology marks one of the most useful advances in recent therapeutics.—E. C. D.]

Influence of X-Rays on Fibroids. The exhibition of *x*-rays in fibroids has generally been limited to those which have produced severe hemorrhage and sometimes pain, the reason being stated that these are generally cases of interstitial myoma, and that submucous fibroids are better treated by surgical means; moreover, that the subserous forms are not amenable to *x*-ray treatment. With these opinions Sir J. Phillips¹ is not quite in accord. He has found that all varieties of fibroid, if properly selected, may be satisfactorily treated. All but 3 of his 19 cases were relieved. As a rule, the best cases to respond are those occurring at the age of 40 or thereabouts, slow-growing, interstitial and producing either hemorrhage, pain, or pressure symptoms, but he saw three cases in comparatively young women—27,

(1) Lancet, March 23, 1918.

29, and 32—where the tumor was first noticed owing to its rapid growth.

The class which are obviously not suitable are submucous pediculated fibroids and those affected with myxomatous, cystic, calcareous, necrobiosis or red degenerations, and infiltration from the endometrium of malignant disease. It is almost impossible to diagnose some of these degenerations, and the failures Phillips met with are quite possibly due to one or other of these conditions.

Fibroid Treated by X-Rays. A married patient, aged 42, consulted F. A. Stoney² in February for a fibroid causing discomfort from its size, with constant backache and pressure symptoms. She had a bilobed fibroid of the whole wall. During three months she received eight *x-ray* treatments, each of two to three pastille doses, filtered. The periods were regular before treatment. Under *x-rays* she had one heavy followed by two ordinary periods, and they have stopped entirely since the sixth treatment, 5 months previous.

The fundus was 4 1/4 in. above pubes. During treatment it was reduced to 2 3/4 in., and three months later was only 2 in. above. In width the tumor was reduced from over 5 in. to 4 in. during treatment, and since then has become reduced another inch. The front wall was bulged out so the distance from pubes to umbilicus was 7 1/4 in. at first; this has come down to being flat, and now measures 6 in. Except during the first monthly period, she has not been in bed for a day since treatment was first begun; pressure symptoms are relieved and backache is gone.

This is the fourth case Stoney has treated in a similar manner, and all with remarkably good results. In one case the menopause was brought about, in 2 the periods were only reduced in quantity.

PART VII.

STERILITY.

Amenorrhea and Sterility. During S. Brothers³ practice of 27 years, cases of simultaneous sterility and amenorrhea have been rather rare. He believes the following one to be of considerable interest: The patient, aged 30, had been married 10 years. Never menstruated, in any way, shape or manner. Sterile since marriage. No similar condition in any relative. On examination, abdominal and bimanual, found infantile uterus and ovaries, and an anteflexion. Also a conical cervix and pinhole os. About a year prior, a physician had resorted to curettage, without benefit.

Brothers introduced a Gehrung pessary, and adopted the usual treatment, including the passage of the uterine sound and the iodide of iron, syrupus ferri hypophosphiti, Fowler's solution, with good results, as far as the chlorotic condition was concerned. But her sterility and amenorrhea continued about the same. The diet was carefully regulated. The bowels were carefully looked after. He administered ergot, aloes, sulphate of iron, oil of savine, etc., without altering the uterine condition. But after the use of oxalic acid in 1/4 grain doses *t. i. d.* for two months, supplemented by the anteroposterior Faradic current externally, curettage and douches, menstruation gradually appeared, and after six months she became pregnant.

Are Diphtheroids a Factor in Sterility? The details of a case are furnished by T. C. Stellwagen, Jr., and P. S. Pelouze.⁴ A man presented himself for study as to the cause of an anterior urethral discharge. He had been married 7 years, during which period he had never had any discharge, nor had there been any exposure.

(3) Amer. Med., July, 1917.

(4) Jour. Amer. Med. Ass'n., April 6, 1918.

The discharge was very largely composed of pus cells and epithelial elements. The only bacterium was the Hoffmann type of the pseudodiphtheria bacillus. He was given the usual routine local treatment, improved and the anterior discharge became scanty and at times disappeared. The prostatic secretion, however, still presented numerous leukocytes and organisms. Under the added impulse of vaccine therapy, the secretion became normal.

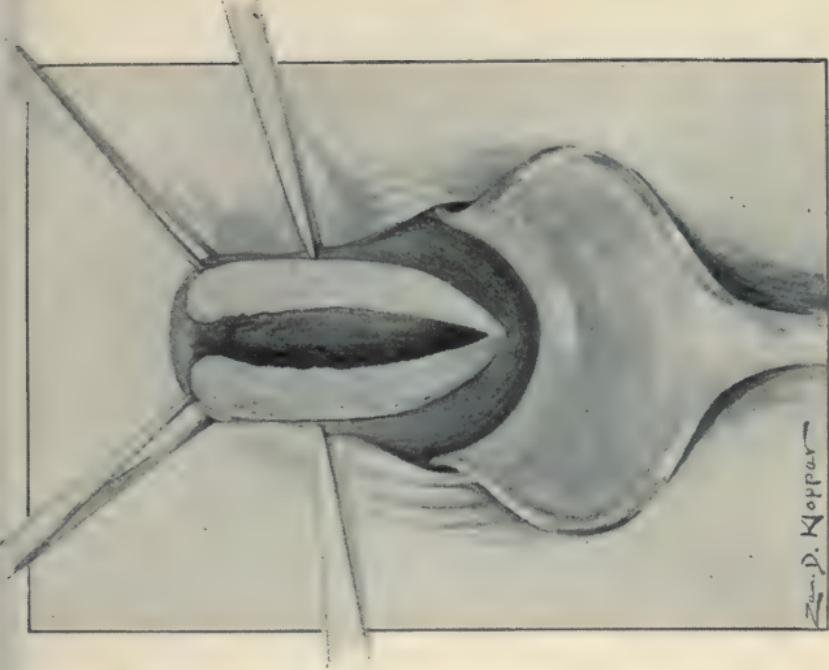
At the time of making the vaccine, they deemed it wise to study the flora of the wife's genital tract to determine the source of his infection. Some time previous she had been given intravaginal medication, dilatation and curettage, and had undergone operation for correction of a malposed uterus. These procedures, however, failed to bring about conception, though the husband's seminal fluid contained very motile spermatozoa. There was complete absence of vaginal discharge. Cultures from the vaginal vault presented the usual flora, with a preponderance of diphtheroids. Those from the cervical canal proved to be purely diphtheroids. Separate autogenous vaccines were made and used. Both patients convalesced promptly with a virtual disappearance of the diphtheroids.

About three months after their dismissal, the husband returned for examination and was found free from his former infection. He thought his wife was pregnant and she eventually gave birth to a healthy baby.

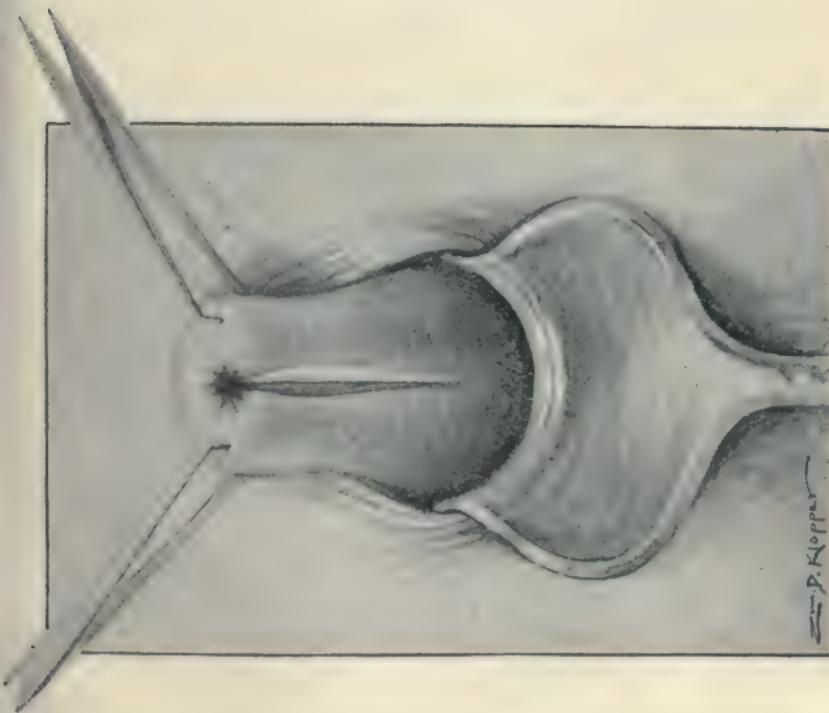
The authors have since had an opportunity to study 2 more cases of sterility. In one a pure culture of diphtheroids was obtained from the cervical canal. In the other there was a mixed culture in which diphtheroids predominated. These patients are now under treatment with vaccines, but too early to make a further report.

New Operation for Obstructive Dysmenorrhea and Sterility. These most commonly depend on a pathologic anteflexion. One must distinguish such an anteflexion, as opposed to the normal anteflexion, to get successful results from any corrective measures. With this distinction clearly in mind, J. Frank⁵ wishes to present

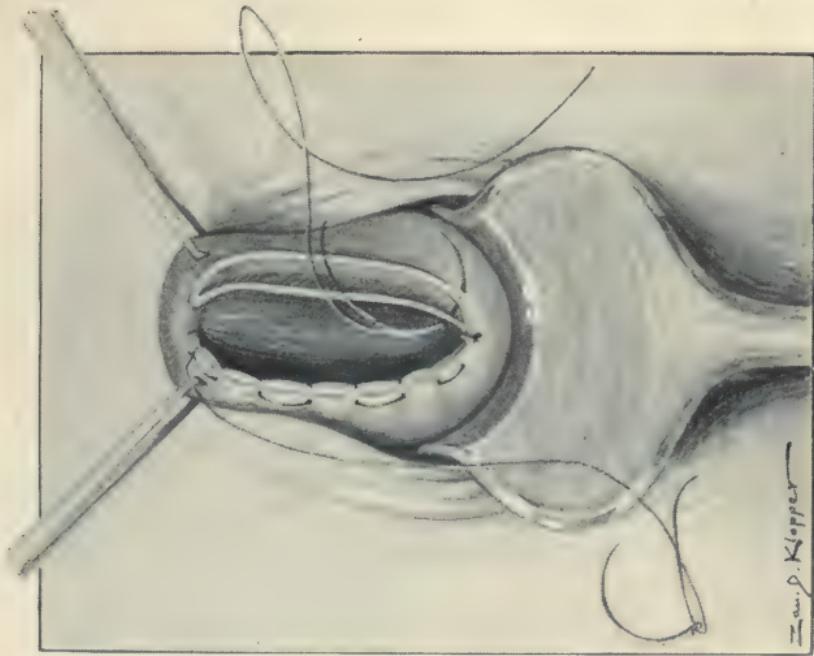
PLATE VII.



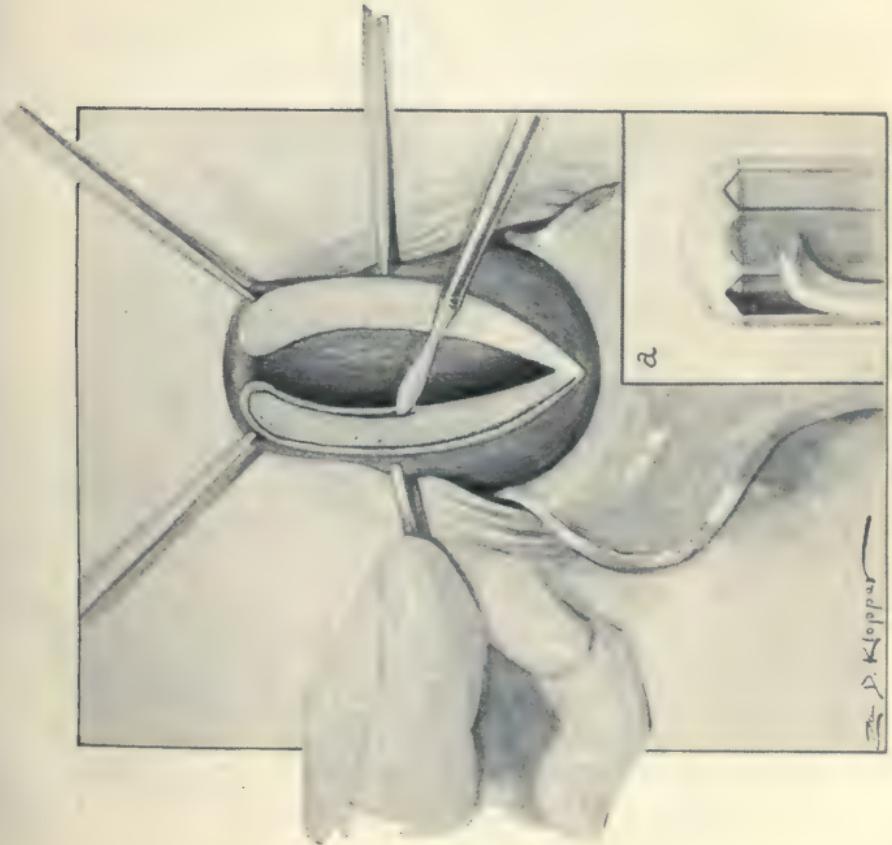
Incision completed, showing two lateral raw surfaces.—Frank (see p. 148).



Uterus brought forward and upward; posterior incision begun.



Suture commencing at the most dependent part of incision, approximating the uterine and vaginal mucosa.—Frank (see p. 148).



Removal of the wedge-shaped tissue; *a*, wedge when removed leaving trough-shaped cavity.

an operation that has successfully corrected the dysmenorrhea in all properly selected cases. It has frequently ended a long period of sterility, and the resulting pregnancy has been terminated in two cases by comparatively easy labors, the passages (particularly the effacement of the cervical canal and the dilatation of the os) acting like those of a multipara.

E. C. Dudley in 1891 described his "plastic operation designed to straighten the anteflexed uterus." The posterior cervical incision (Sims), plus the removal of small wedges of the whole cervical thickness from both sides to bring the external os directly backward when the cut surface is folded on itself by a single silkworm-gut suture. Several interrupted sutures are added for safety.

Frank's operation recognizes the value of the posterior incision in straightening out the cervical canal and so correcting the stenosis at the internal os. The cervix is grasped at the uterovaginal junction with small tenaculum forceps, one on each side, and pulled out and up. An incision is made in the middle of posterior lip extending well up to and past the flexion. The tenacula are then removed and used to spread apart the two halves of the posterior lip. With a very small-bladed, spear-shaped knife, on the catlin order, wedges of tissue are removed from the two raw surfaces of the posterior lip, leaving a trough. Just enough tissue is removed to allow easy and exact approximation of the entire cervical and vaginal surfaces. The first suture is commenced at the angle of posterior incision and extreme care taken to approximate accurately the internal cervical and the vaginal mucosa at this point. This is important, to avoid healing by granulation and so secondary contraction. Twenty- or forty-day No. 1 chromic gut is used in a continuous or interrupted suture.

The original Pozzi operation is ideal in true "pin-hole os," *i. e.*, for obstruction at the external os. But in many cases the dysmenorrhea and sterility result from angulation of the uterocervical canal at or near the internal os. And Frank's experience leads him to believe that angulation never takes place above the inter-

nal os. This angulation is completely done away with by the operation described, by eliminating entirely the canal below the angulation, as the posterior incision extends up to and beyond this point (Plates VII-VIII).

Obstetrics

EDITED BY

JOSEPH B. DE LEE, A. M., M. D.

PART I.

PREGNANCY.

PHYSIOLOGY AND ANATOMY.

Blood-Pressure Observations. W. C. Danforth¹ concludes that the average blood-pressure of the pregnant patient is less than that of non-pregnant ones. Labor causes in many instances a rise of arterial tension. Toxemia of pregnancy is accompanied by a rise of pressure, except on very rare occasions, and this rise usually precedes other symptoms.

Value of Blood-Pressure Determinations in Obstetrics. This topic is considered by J. M. Slemons.² The

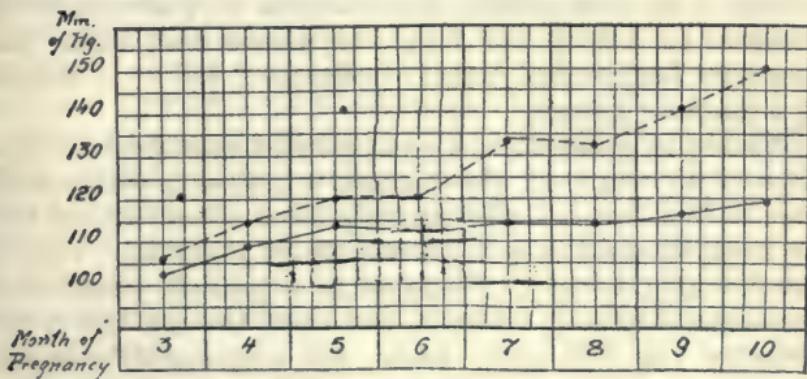


Fig. 1. Systolic blood pressure during normal pregnancy. The monthly average is represented by the solid line. The tension indicated (115 mm. of mercury) is considered normal. The broken line indicates the highest observation during each month. A pressure of 150 mm. of mercury should be regarded as an early sign of preeclamptic toxemia (Slemons).

prenatal records of 500 normal cases in the Yale Clinic are shown in the chart.

In the average case (solid line), the systolic pressure remains within normal limits, although in the early

(1) Amer. Jour. of Obstet., June, 1918.

(2) Jour. Amer. Med. Ass'n., Sept. 8, 1917.

months the values are somewhat lower, and in the later somewhat higher, than in the middle trimester. From the 5th to the 8th month, the prevailing tension (115 mm.) is identical with that generally considered normal.

Hypotension is more common early in gestation, but may also occur later, and is then said to be prophetic of shock during labor. In his experience, however, a systolic pressure of 90 mm. in the last month has not been incompatible with normal parturition.

On the other hand, the maximum tension in normal cases is of great practical moment; we wish to know what height gives warning of impending eclampsia. Not infrequently in the latter half of pregnancy, hypertension occurs in patients who proceed normally to delivery. Even a pressure of 150 mm. may not indicate serious toxemia. But, it is advisable to regard the hypertension as the earliest sign of preeclamptic toxemia, and so affords the opportunity to institute conservative treatment when most likely to be effective. Consequently, his custom is to make daily observations on patients with a pressure of 140 to 150 mm. Hygienic and other measures are begun and when ineffective, labor is induced by a uterine bougie.

While the greatest service of blood-pressure determinations is to warn of threatened eclampsia, occasionally, even in the face of albuminuria such observations teach the complication is not preeclamptic toxemia. This use was brought home to Slemmons in a patient whose urine contained 3 gm. of albumin per liter, though the systolic pressure was 135 mm. Here, the responsible complication was pyelitis, and recovery followed administration of urinary antiseptics.

When patients are carrying the double burden of a valvular lesion and a toxemia, familiarity with the blood-pressure is indispensable as a therapeutic guide. Probably by this means we shall acquire a more timely method of recognizing the approach of a break in compensation in chronic valvular disease and, therefore, of deciding the question of inducing labor as a prophylactic measure.

[The Editor has not found the blood-pressure during pregnancy to vary much from the usual. In cases of toxemia the pressure is almost invariably raised. Cases

are reported of eclampsia without increased blood-pressure, but the Editor has not yet met one. He has had increased blood-pressure without eclampsia, but there were always signs of toxemia also. Without question, the manometer is a valuable aid in discovering pre-eclamptic conditions, and should be used routinely in the care of pregnant women.—ED.]

Antitryptic Power of the Serum in Pregnancy. Some researches on this point were undertaken in Bar's laboratory by G. Ecalle.³ He found antitryptic power is increased during pregnancy, and progressively from the beginning until toward the 6th month. It remains high and almost constant in the last months, as well as in the first few days of the puerperium, then becomes gradually lowered from the 14th day.

It appears to be more marked in cases complicated by the accident called "gravidic intoxication." The determination of this power, while interesting, cannot by itself aid in the diagnosis of doubtful cases. The increase seems to be due: (1) To penetration into the maternal blood of tryptic ferments from the placenta. (2) to the presence in the maternal blood of the antiplacental proteolytic ferments of Abderhalden.

Strength of the Serum of Pregnant Women in Fats and Lipoids. According to the investigations of G. Ecalle⁴ there is a lipemic state present at the end of gestation, and it is rational to establish a correlation between it and the surcharge of fat in most of the viscera, which has been demonstrated many times in pregnant women.

As regards cholesterol, his findings corroborate those of former investigators. The quantity in the serum increases progressively during pregnancy, reaching the maximum in the last months.

The Movements of the Sacroiliac Joints. Some anatomists claim there is no mobility in the sacroiliac joint. Others say there is considerable gliding and rotary motion. Observations were made by E. F. Cyriax⁵ upon the

(3) Arch. Mens. d'Obstét. et de Gyn., April, May, June, 1917.

(4) Ibid.

(5) Edinburgh Med. Jour., August, 1917.

following: (1) Normal subjects. (2) During pregnancy. (3) In subluxated ilium. (4) In chronic relaxation of the joints. (5) In compensatory movements of the joints. The movements were tested as follows: (a) For rotary motion in both joints. Patient on back; semirecumbent. One hand above anterior superior spine of one side; other hand below corresponding point of opposite side. One hand was then depressed as other was elevated, thus trying to move one ilium down and the other up. (b) For rotary motion of one side alone. Patient on side. One hand over anterior spine, and other over posterior portion of ilium. The anterior hand is moved forward and down, and the posterior hand up and back. (c) For gliding motion of one side. Patient and hands as in (b). Attempt to move ilium *en masse* up or down.

There is very slight "give" in young normal subjects; practically none after 30. During late pregnancy, a greater amount of "give" is obtained than in non-pregnant subjects, but actual rotary or gliding motion is not seen. Actual movements of rotation or gliding points to a pathologic condition.

Sacroiliac Joints in Obstetrics. According to J. C. Litzenberg⁶ these joints are certainly movable during pregnancy, and while usually fixed in the nonpregnant state, may be movable under certain conditions. This normal relaxation makes them very vulnerable; they are often the cause of discomfort, pain, displacement and even disability. Every pregnant woman is a potential sacroiliac patient and should have her pelvis supported and faulty attitude corrected by a corset.

The milder cases give only moderate discomfort, which, however, on account of the constant prolonged irritation during pregnancy, give rise to nervous symptoms and are a large factor in neurasthenia. He has seen a properly fitted combination corset, abdominal support and sacroiliac belt change an irritable neurasthenic bemoaning her pregnant state, into a happy, prospective mother.

[An often overlooked cause of discomfort during pregnancy.—ED.]

The Placental Villi. A series of placentæ from all

stages of gestation was studied by M. de Kervily,⁷ using new mitochondrial methods.

In the *syncytium* which covers the villi, he describes mitochondria, lipoid granulations, which are met with at all stages and always with the same aspect. The mitochondria are the means on which the substances destined for the chemical functions of the cell are fixed, and at all stages the *syncytium* elaborates the same products: (A) The granules of secretion, which once they are mature, accumulate close to the free surface and do not enter the intervillous spaces, except by dialysis, after being liquefied in the protoplasm where they were formed. (B) The fatty granulations which do not penetrate from the maternal blood as has been claimed, but are elaborated in the syncytium itself. Some of the characters of the chondrioma of the placental syncytium, e.g., absence of double polarity, distinguishes the absorption in the syncytium from that which occurs in the interstitial cells.

The cilia of the syncytium the existence of which has been denied, are really present at all stages and even take part in the absorption of the hemoglobin granulations by the syncytium (one of the sources of iron destined for nutrition of the fetus). These cilia may gather into fascicles, then fuse into protoplasmic prolongations, where the reserves of the secretion granules accumulate. At this functional stage of the syncytium, there is an important morphologic modification—disappearance of the superficial membrane.

The *Langhans cells* (present not only in the early months as is claimed, but up to term) enclose mitochondrial formations at all stages of pregnancy, and at all these stages have the same appearance. The Langhans cells secrete substances which accumulate in their vacuoles, they are not polarized and behave like cells from a gland of internal secretions.

The *vacuolar cells* which exist in the stroma of young placental villi are not phagocytes as claimed by some, but connective cells, they never penetrate into the capillaries. Secreting cells, their protoplasm, contains mitochondria, secretion granules and vacuoles, varying in

quantity, according to the functional stage. Neither freeing of the secretion granules nor bursting of the large vacuoles is to be seen, consequently here, also, the secretion to escape from the cell must pass through by dialysis.

HYGIENE.

Care of the Feet in Pregnancy. G. Gellhorn⁸ points out that in pregnancy all tissues are more succulent. The joints also become softened and looser as pregnancy progresses. This fact is so well known as far as the pelvic joints are concerned that we take it into account in slight degrees of pelvic contraction (Walcher position). The foot joints are subject to the same changes; but what originally was physiologic may eventually become pathologic and permanent, if the increased weight is permitted to rest upon the foot not properly supported. Many pregnant women avoid active exercise, particularly walking, and in consequence the muscles of the foot and leg, which should share the burden, become weakened so the ligamentous structures largely have to bear the strain.

During the puerperium the muscular weakness makes rapid progress, and the flabbiness of the calves testifies to the extent of atrophy. The cold extremities, tingling in the feet, and weakness of the knees on the first attempts to rise from the lying-in bed, may be the fore-runners of a permanent flat foot.

The patient who complains of painful feet should not be told this "inevitable discomfort" will cease with birth of the child, but the foot should be strapped at once and strapping continued as long as necessary. A suitable shoe should be prescribed by an orthopedist. At the same time, *methodical* exercises to strengthen the plantar muscles, tibialis posticus and anticus, and those that give spring to the foot, should be instituted. The patient is seated with the knees crossed. The foot (not the leg) is slowly bent up and down; then follows a complete rotation in the ankle to the right and another to the left. These exercises are gradually increased in number until each is taken 50 or more times. To

strengthen the plantar structures still further the toes are trained to grasp a solid rubber ball about the size of a "ping pong" ball, and this exercise, too, is gradually increased.

A New Shoe for Wear During Pregnancy. According to J. Grossman⁹ the pathology of weak feet during pregnancy does not differ materially from weak feet in general. The majority have an eversion of the heels and heel cords, from a very slight to a well marked valgus. To correct this, build a lift on the inner side of soles and heels. The thickness depends upon the degree of eversion; it is commonly $\frac{1}{8}$ or $\frac{1}{4}$ inch. A cross bar of $\frac{1}{8}$ inch is built in the metatarsal region of the shoe, to relieve or prevent a metatarsalgia, which is so commonly associated with weak feet.

This new shoe which he recommends presents the following features: Expansion top to compensate for edema. A $\frac{1}{8}$ or $\frac{1}{4}$ inch elevation on inner border of sole and heel to overcome or prevent eversion. A cross bar of $\frac{1}{8}$ inch to relieve and prevent metatarsalgia. A cushion rubber lift in the heels to give jar-relieving steps. Rounded edge heel to prevent catching in carpets or dresses. Built on anatomic principles, so weight bearing is evenly distributed upon the feet (Plate IX).

DIAGNOSIS.

The Cobra Venom Reaction. G. Ecale¹ finds the activating power of serum on cobra venom is more marked in pregnancy. This power increases progressively in the first months, reaches its maximum toward the 6th month and remains there until labor. This activating power is often higher in patients with toxemia. The reaction seems to be provoked by an increase of the lecithin in the serum. Ecale believes after the 3d month, by its constancy and intensity, it may become an element of secondary value in the diagnosis of obscure cases.

{9} Med. and Surg., August, 1917.

(1) Arch. Mens. d'Obstét. et de Gyn., April, May, June, 1917.

Rectal Examinations. Probably nothing, in B. G. Hamilton's² opinion, has contributed more to obstetrics recently than rectal examinations. While abdominal examination, together with proper interpretations of clinical evidence, is to be more relied on than vaginal examination, yet it is necessary to make examinations; and rectal examination offers the least chance for infection. Practice with rectal examinations will reduce the necessity for vaginal examination to a minimum. If one is familiar from external examination with the position, has made pelvic measurements beforehand, and will watch heart action, remembering that a fetal heart over 150 or below 120, or irregular, is doing badly, there will be little cause for examination, either rectal or vaginal. Special care should be taken in making rectal examination. The patient should be shaved or clipped, an enema given, and parts cleansed with soap and water, and followed by 2 per cent. lysol. One should use a sterile rubber glove, and examination followed by a careful cleansing of the parts. With patient on the side, the hand does not come in contact with the vulva.

Some of the Advantages.—1. In border-line cases where Cesarean section is to be considered, infection is reduced to a minimum.

2. It is more easily done when the examiner wants to determine if necessary to stay with patient.

3. Rectal examination, when carefully done, is more agreeable to patients; at least, they complain less. It is a protection to the physician when infection follows delivery. Those who do not use rectal examination should give it an honest, thorough trial.

[The Editor wishes to strengthen this request for a trial of the rectal method of pelvic exploration. With a little practice unthought-of results will be accomplished. The best information is obtained after the head has engaged and the cervix has begun to open, and it is at this period that the greatest need exists for the pelvic examination. The degree of advancement of the head in the parturient canal is accurately determinable, the amount of the dilatation of the cervix also. Position and presen-

PLATE IX.



(a) Conventional shoe. (b) Orthopedic shoe (back view). Note the expansion top.



Lateral view of the shoe. Note the rubber lift in the heel.—Grossman (see p. 159).

tation can often be made out, even prolapse of the cord or the arm—also breech and face. In all cases of doubt one may still have recourse to the old method, but the Editor has been able to conduct 95 per cent. of spontaneous labors without this dangerous interference.—ED.]

Diagnosis of Pregnancy in the Early Months. According to L. Eliot³ there must be a history of cessation of menstruation, nausea or morning sickness, irritability of the bladder, annoyances of the breasts, together with discoloration of the vagina, uterine fluctuations, descent of the cervix, and Hegar's sign, before a positive opinion may be expressed; and these must be in evidence from the 4th to the 12th week. To formulate an opinion based upon all the signs mentioned, a vaginal examination will be necessary.

The Jorissenne sign has been relied on hundreds of times. It is a study of the pulse in the early weeks, is seldom mentioned in works on obstetrics, and the result of a physiologic hypertrophy. As the heart becomes hypertrophied in typhoid and returns to normal after recovery, so does it become hypertrophied in pregnancy, to return to its original state after delivery. This is a passive, a compensatory hypertrophy, and not due to pathologic conditions. [?—ED.]

Graves' law is: "In physiological hypertrophy of the heart, the pulsations (at the radials) maintain a constant frequency in every position of the body." In healthy persons the pulse beats with greater frequency in the standing position than in the horizontal, the difference being 5 to 15 a minute. If the number of pulsations does not exceed 60, the difference is not greater than 6 or 8, and it increases proportionately to the frequency of pulsations at the examination; *e. g.*, if moderate exercise has caused a rise to 90 or 100, it is not unusual for the difference to be 20 or 30 pulsations.

[Of very doubtful utility.—ED.]

Diagnosis of Fetal Age By Roentgenograms. J. H. Hess⁶ states the average lengths of normal fetuses as given by different authors are as follows:

(3) Virginia Med. Semi-Month., Dec. 21, 1917.
(6) Illinois Med. Jour., February, 1918.

Lunar months.	Mall. cm.	von Winckel. cm.	De Lee. cm.	Lambertz. cm.	Ahlfeld. cm.	Schroe. der. cm.
1st	- 0.25	.....	0.75-0.9	.....	.....	.....
2nd	0.55- 3.0	0.9-2.5	2.5	.....	.....	.....
3rd	4.1 - 9.8	7-9	7-9	6-11	.....	.....
4th	11.7 -18.0	10-17	10-17	11-17	.....	.....
5th	19.8 -25.0	18-27	17-26	17-28	.....	.....
6th	26.8 -31.5	28-34	28-34	26-37	.....	.....
7th	33.1 -37.1	35-38	35-38	35-38	36-40	....
8th	38.4 -42.5	40-43	43	38-43	40-43	41.3
9th	43.6 -47.0	46-48	46-48	42-45	46-48	44.6
10th	48.4 -50	48-50	48-50	45-52	48-50	46.0

The length for the first two months is from vertex to buttocks, all others are from vertex to sole.

The weight is entirely unreliable for estimation of the age, it is subject to too many variations and much influenced by mother's general condition and more especially her diet.

After a study of 55 roentgenograms of normal cases, Hess finds ossification begins in the upper part of the body, and spreads very rapidly in both directions.



Fig. 2. Diagram of fetus at 7 weeks, actual size.



Fig. 3. Same, 8 weeks.



Fig. 4. Same, 10 weeks (Hess).

In the very early period (2d month) the stage of ossification of clavicle and mandible is of chief importance and on the presence or absence of these centers determination of the age is made. Both roentgenograms and transparent specimens show the time of appearance of these is almost constant, which makes them of cardinal value.

Next in importance are the centers of the upper extremity and especially of the hand (metacarpals and phalanges) which are very regular not only in their appearance, but also in their sequence. The ossification of the diaphyses of the long bones of arms extends from the 8th to the 16th week and during this period the determination of the age may frequently be done from a good roentgenogram of the hand alone.

The ossification of the head is also of considerable diagnostic importance, but the centers in many bones are very difficult of demonstration. Those, however, that can be well demonstrated, are of much value. Especially the occipital, superior maxilla, tympanic ring, nasal and hyoid.

The vertebral column is much less reliable, and especially its lower portion is of little value. It is not the absolute number of arches or of the bodies ossified which decides the diagnosis as to the age, but more the region involved and the extent of the development in the particular region (cervical, dorsal, lumbar, sacral). However, the fact that ossification of the spine extends from the 9th week throughout fetal life and all its centers, as a rule, are well demonstrable, make it of especial value for at least approximate determination, although occasionally ossification may be delayed here, while normal in other portions of body.

Sternum is unreliable and its centers frequently difficult to demonstrate. The ribs are fairly constant, except the 12th pair which may not show at all in comparatively old fetuses.

While ossifications of the long bones of legs are pretty regular, since they appear early, ossification in the foot is very irregular and of little value. The osseous development of the foot extends from the 9th week to the end of the fetal period (not being completed even

then) and during this time there are very marked variations, especially in the centers which appear late.

As a general rule, the earlier a center appears the more regular it is and since ossification starts in the cephalic region and spreads caudally, it is also true that the more caudad a skeletal segment is situated the more it is subject to irregularities.

[Let us hope that Hess will continue these interesting studies, as the *x*-ray is easy of application, and we may thus acquire a reliable method of determining the age of a given fetus. The value of this is self-evident. Several years ago the Editor began a series of studies with the same object in view, but found the development of bony centers too irregular to be adopted as a guide.—ED.]

Modified Ahlfeld Method for Determining Fetal Age. H. Thoms' describes this as follows: The patient is in the lithotomy position. If the head is high up and can not be reached per rectum the vaginal route becomes necessary. If, however, the vertex can be palpated at all, the rectal route becomes preferable, and on account of the lessened danger of infection the finger is in the extension of a line corresponding to the axis of the fetus in utero.

An examination is made in the usual manner passing the finger or fingers to the cervix. If the vertex (or breech) is in the birth canal it may be easily palpated through the anterior fornix. If the presenting part is too high up, slight pressure by an assistant upon the fundus will bring the presenting part down.

With the hand in position, the finger against the head and in line with the longitudinal axis of the fetus, an assistant measures with a pelvimeter the distance from the uppermost point of buttocks through abdominal wall to any easily available point on the examining hand outside the vulva. The index finger of the other hand is now placed at this point against the tip of pelvimeter (illustration). The reading is made and with the finger tip of the non-examining hand still in position the examining hand is withdrawn. The distance from the

tip of examining finger to where the pelvimeter rested is now measured. This subtracted from the former reading will give the distance from the vertex to the uppermost point of buttocks after subtracting a small amount for the thickness of abdominal and uterine walls.

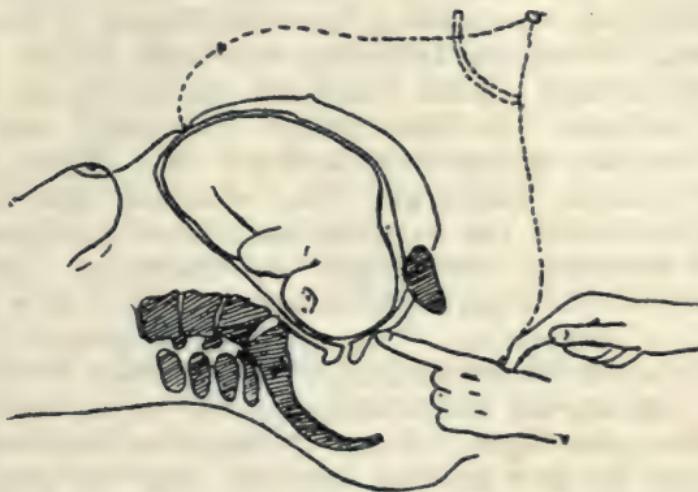


Fig. 5. Line drawing showing pelvimeter in position for measuring distance from upper fetal pole to arbitrary point on examining hand. Later the distance from the arbitrary point to tip of examining finger is measured and this subtracted from first reading (Thoms).

If the examining finger has rested against the head itself through a patent cervical canal, it is Thoms' custom to deduct 1.5 ctm. before multiplying by 2 as in the Ahlfeld method. If, however, the palpation has been made through the anterior fornix, either rectally or vaginally, 2 ctm. are deducted. Of course, further observation may necessitate a change in either or both of these two figures, but up to the present time the results have been gratifying.

The employment of the rectal route is obvious. This modification has the following advantages: The length of the folded child in utero may be determined with greater accuracy than by external methods. The method becomes of wider use, no special instruments being required. It is rapid and conflicts in no way with aseptic technique.

PATHOLOGY.

Pituitrin in Concealed Accidental Hemorrhage. W. A. Kidd⁸ gives the details of a case in which he believes life was saved: A multipara, of 40, was nearly 8 months pregnant. Three days previous she was severely kicked by a child she was nursing, and complained of pain and gradually increasing faintness, but there was no external hemorrhage. Kidd found her semiconscious, in extreme collapse. No labor pains. The cervix was softened and the os admitted a finger tip. There was a slight sanguous discharge. The abdomen was merely tense and tender, but from the history and condition concealed accidental hemorrhage was diagnosed. He sent for pituitrin and gave a large saline enema and a hypodermic of strychnine. Two ampoules of pituitrin were then injected intramuscularly. In less than 10 minutes there was marked improvement of the pulse, and in 20 minutes pains began. Every 30 minutes from the first injection he gave another ampoule, and the pains became gradually stronger and longer. The membranes were ruptured when os was fully dilated, and 3 hours after first injection a living child was born. The placenta was readily expressed and with it large masses of clot. The uterus contracted firmly and there was no post-partum hemorrhage. The mother made a slow recovery. The child only survived a fortnight.

In all, 8 c.cm. of pituitrin were given; it had no galactagogue effect, doubtless owing to the excessive loss of blood. Had delivery been effected by accouchement force or by Porro's method, considering her desperate condition, her chance would have been very poor.

[While the termination in this case was favorable, the Editor would warn to great care in the administration of a powerful agent like pituitrin when there is danger of rupture of the uterus.—ED.]

Pregnancy in Tabes. This rarely occurs: (1) because tabes occurs about ten times more frequently in men; (2) decrease in sexual desire and power may be an early symptom, and (3) a majority of the cases occur between 30 and 40, when the frequency of preg-

nancy is waning. Classic texts scarcely refer to the coincidence of tabes with pregnancy and labor.

E. M. Allen⁹ reports a case in I-para, 37 years of age. She was married Sept. 26, 1913, and the first child was born July 3, 1914. She then had two miscarriages at approximately 3 months each, spontaneous and absolutely painless. Shooting pains began in January, 1915. She was admitted Jan. 14, 1917, and the diagnosis of ataxia was made on the history, and the physical findings, especially Argyll Robertson pupils, absent knee-jerks, Romberg sign, ataxic gait and positive Wassermann, both blood and spinal fluid. March 6 there was spontaneous onset of an indolent labor of probably 72 or more hours' duration, absence of pain until the head was on perineum, and then less than might be expected.

Twin Pregnancy With Macerated Fetus. This case is reported by P. A. H. Egerton.¹ The patient, a III-para, aged 28, was expecting labor in about 6 weeks. At midday she slipped and fell back, and at 8 p. m. passed a partly macerated fetus, 7.5 inches long. The placenta had not come away, and a small shriveled cord was hanging from the vagina. The abdomen was next examined, and the uterus found on a level with umbilicus. On auscultation a fetal heart was heard. The following day she was delivered naturally of a living, premature, female child, length about 15 inches. The child was cyanosed and very feeble. The placenta followed in 20 minutes. No postpartum hemorrhage. The placenta was normal and had two separate cords. The one to the living fetus was normal; the other shriveled and atrophic. The second child survived only one week.

This case demonstrates that, in a twin pregnancy, one fetus may die, while the other continues to develop normally; also that the uterus may carry the dead fetus to a much later period of the pregnancy. The onset of labor was determined by the accident. Nineteen hours separated the birth of the living from that of the dead fetus.

[The Editor recently delivered a case where the pa-

{9} Jour. Amer. Med. Ass'n., Sept. 22, 1917.
(1) Lancet, Nov. 17, 1917.

tient fell against a corner, killing one fetus. Both were carried 3 weeks. The living child came first, then the macerated one. The former was a microcephalus—perhaps the result of cerebral injury, and died in 8 weeks.
—ED.]

Triplets Twice in One Year. The patient, aged 33, had had 8 children and a miscarriage at 3 months. M. Hornstein² was called July 10, 1916, and delivered her of 2 girls and a boy; weights, 3.4, 3.2 and 3.6 lbs., respectively. The boy lived a month, the girls died the following morning. It was calculated the pregnancy was about 33 weeks advanced.

He was called again June 30, 1917, when patient was in active labor in 8th month. The 1st and 3d babies were girls presenting by vertex; the 2d a boy, breech. Weight, 3, 3.1 and 3.4 lbs. A double and a single placenta (in the other instance there were 3 separate placentæ). All the babies died within a day. At end of puerperium, mother showed loss in weight of 30 lbs.

Gestation Prolonged to 12 Months. On May 6, 1916, J. T. R. Miller³ was consulted by a patient, aged 28. He calculated that normal delivery should take place about Nov. 19, 1916. On that date he was sent for, as pains had begun fairly strongly, and a discharge of liquor amnii had taken place. The os was dilated to the size of a quarter and the vertex presenting. Pains were very slow—15 minutes interval—and of short duration. These continued for just over 24 hours and then ceased. The case dragged on until on Feb. 11, 1917, labor definitely set in, and she was delivered by forceps of a healthy female child next day, after 12 months' cessation of menses and undoubted pregnancy, for no marital relations had taken place since just previous to Feb. 12, 1916. Fetal movements during the last 3 months were very feeble.

Miller has been engaged in midwifery practice for over 30 years, and has never come across a case like this. Playfair quotes 4 cases in which pregnancy extended, respectively, into 336, 332, 324 and 319 days, so it is quite feasible for it to extend another 29 days.

(2) Jour. Amer. Med. Ass'n., Jan. 26, 1918.

(3) Practitioner, January, 1918.

[The Editor would require more information before accepting this as a case of pregnancy at 12 months' duration. Missed labor—with dead fetus—is not uncommon, but a 12-months' gestation, *i. e.*, live fetus, has not yet been authenticated, and since our courts of law reflect the opinion of the medical profession, and since the questions of bastardy, heirship, etc., are so vitally important, we must support with incontrovertible proof the demonstration of a pregnancy lasting twelve months.
—ED.]

Gonorrhea as a Complication of Pregnancy. The termination of pregnancy complicated by gonorrhea is usually delivery at term, although if the infection be violent and acute, abortion may occur. Furthermore, if there be an associated endometritis, malformations may take place from faulty implantation of the ovum.

The principal danger arises during the puerperium, the gonococcus being the most common agent for pelvic infection during this period. Pure gonorrhreal puerperal sepsis is, so E. A. Schumann⁴ believes, uncommon, but if the infection become mixed, serious lesions of the pelvic tissues almost invariably follow.

The treatment naturally falls into the management during pregnancy, and the conduct of labor and the puerperium.

During pregnancy the local treatment should follow the general line of gonorrhea therapy, except that large douches or vaginal tampons should not be employed. If the disease be acute and present as a violent inflammation of the vaginal mucosa and cervix uteri, frequent applications of a fairly strong silver solution are indicated. A good practice is to coat the vagina thoroughly with silver nitrate, 20 grains to the ounce, at two-day intervals, a cleansing douche to be used by patient on alternate days. The douche should be mildly antiseptic, not to exceed one quart, and given with practically no pressure, one-half per cent, formalin making an excellent solution. Abscesses in Bartholin's glands must be evacuated under local anesthesia and the cavity thoroughly disinfected with a strong silver nitrate solution or pure iodine.

Where the gonorrhea assumes the usual chronic form, manifested only by a profuse leucorrhea with a moderate thickening and congestion of the vaginal mucosa, treatment by instillation of a dram of brewer's yeast or the dry yeast spores marketed under several trade names, offers the greatest hope for relief. The applications should be made every other day, the yeast held in place by a small pledget of cotton, just within the vulva, not in contact with the cervix. Cleansing douches, as outlined, should be used on alternate days. Gentleness and avoidance of pressure on the cervix or fundus are essential to success.

Should a pelvic peritonitis supervene, absolute rest in bed and application of heat, and the ordinary general therapeusis of infection, is the plan to be followed.

The use of antigenorrheal vaccine or serum has been advocated and some good results reported, but Schumann fears a pronounced reaction with injury to the embryo.

If the patient is to be spared the prolonged morbidity and risk of death from a puerperal infection, two essentials must be observed: There must be no traumatization of the genitalia, and there must be absolute asepsis, that no complicating organisms may enter the birth canal. How are these to be attained? Labor must be spontaneous if at all possible. Hasty intervention with forceps or version is to be condemned. All manipulation, massage, Credé expression of placenta, and the like be rigorously avoided.

Vaginal examination should not be practiced in this group. All necessary information may be easily elicited by rectal touch.

Obviously all precautions with regard to the cleanliness of the external genitalia should be put into practice. Removal of the pubic hair, and if necessary, by reason of infection, painting of labia and the site of Bartholin's glands with a strong silver solution done. After delivery no douche, no exploration of the uterine cavity, no extensive manipulation of the fundus through the abdominal wall.

Intermediate repair of perineal injuries, performed in 3 to 6 days, is especially indicated. In the meantime careful irrigation of the external parts, by salt solution

or boric acid poured from a pitcher, will tend to avoid mixed infection.

Colon Bacillus Infection, Extragenital, Complicating Pregnancy and the Puerperium. E. P. Davis⁵ passes in review the methods of treatment usually adopted in infection of the kidney with this organism, viz., posture, drugs, vaccines, catheterization of ureters and nephrotomy, and after relating several cases of pyelitis of pregnancy benefited after failure by medicinal means, by the operations referred to, gives his observations on cases in which infection with the colon bacillus attacking the appendix, the colon and surrounding tissue has complicated pregnancy or the puerperal state. The symptoms are often obscure, and the differentiation between appendicitis and infection of right kidney and salpingitis may be impossible before the abdomen is opened. Leukocytosis, widely distributed tenderness, beginning paresis of the intestine without signs of active peritonitis point strongly to infection by the colon bacillus. When this occurs in puerperal patients the diagnosis from septic infection is usually difficult. A point of difference is the non-suppression of lochia. The treatment consists of abdominal section, removal of the appendix and free drainage. Davis cites several operations, and describes the peculiar inflammation and distension of the cecum and once of the whole large intestine, with non-perforative ulceration.

It is especially important for the welfare of pregnant women and their children that this infection be promptly recognized and thoroughly treated. The dangers of appendicitis in the pregnant woman far exceed those of the non-pregnant, and while a patient during pregnancy may escape apparent injury from cholecystitis, an infected gall-bladder rarely recovers after pregnancy without drainage. In the puerperal period it must have happened that cases of this condition were confused with puerperal infection in the genital tract and were so treated. There is no evidence that this condition affects the infant and it seems remarkable the secretion of milk is so slightly retarded. Ready confirmation of the diagnosis of colon bacillus infection was offered by

microscopic and bacteriologic examination of the appendices removed and of the serum from the abdomen.

Urinary Infections of Pregnancy. Judging by the fact he has seen 4 cases during a period in which he saw only 1 case of eclampsia, F. H. Smith⁶ believes these are not rare. Pregnant women are predisposed by reason of interference with drainage and conditions are ideal for transmission of infection. The colon bacillus from the bowel is the usual agent.

When a pregnant or puerperal woman has any febrile illness, whatever may be the type of fever, or whatever the associated symptoms, a catheterized specimen of urine should be obtained at the first visit. If this be cloudy, acid, and albuminous one should immediately suspect infection of the higher urinary tract and make a microscopic examination before any other diagnosis is accepted.

Clinical signs and symptoms may be most confusing without, or even with, laboratory aid, and especially are we apt to miscall the case appendicitis, because the pain, tenderness, and rigidity are most often right-sided. In such case the right kidney region ought always to be examined for tenderness, etc.

Treatment which has been efficacious and at the same time practicable is (1) rapid alkalinization of the urine with potassium citrate. This has been more certain, by far, than hexamethylenamin. Certainly, potassium citrate and hexamethylenamin should not be given at the same time, for one tends to render the urine alkaline and the other depends upon a high acidity for any possible value; (2) in the meantime we can usually get a supply of the "sensitized" vaccine, of the colon bacillus, because it can be sooner given than (3) an autogenous vaccine, which should be prepared as soon as possible. Under such treatment all of his cases so far have been controlled until delivery has cleared up the picture. But should the symptoms persist stormily, then the patient should be referred for irrigation of the kidney pelvis, or possibly even nephrotomy or nephrectomy.

Mere persistence of pyuria, on the other hand, is to be expected, and need occasion no undue alarm, if the

patient be symptomless, and especially if there be no fever at all and no leukocytosis. Such patients usually go to full term, immune apparently from risks of their infection.

Fibromyxomatous Degeneration of the Chorion With 4 Consecutive Pregnancies. From his experience in this case, and 2 others, J. C. Applegate⁷ feels quite sure the hypertrophy and degeneration began at the time of placental formation, certainly not later than the early part of the 4th month. Another feature indicating the early changes during the developmental process is the tendency to malformations, as shown by the fetus in this case—ascites, harelip, cleft palate, ankylosed shoulder and elbow-joints.

The clinical picture is too rapid enlargement of the uterus, with too great solidity on palpation and percussion, exaggeration of all the reflex signs of pregnancy, recurrent and persistent nausea and vomiting, pain and edema from pressure, diminishing heart sounds and movements. Whether or not intra-uterine death occurs depends on the area of placenta thrown out of function by the diverted circulation.

Three fetuses were still-born, 2 macerated, and the other breathed feebly a few times; all were water-soaked. Two placentæ were low enough to constitute previa, the others were partial abruptio. Adhesions tend to form between the unseparated portion and the uterus, and all 4 in this patient required separation and manual extraction. The placentæ were all large, hard and gelatinous, entirely unlike the large edematous ones of active syphilis.

This condition is not in any sense related to the malignant chorioepithelioma, nor does it predispose to it. There is excessive softening of the uterus, however, during the growth and a greater tendency to laceration and rupture during delivery. Involution though slow is finally complete. The patient is none the worse, and just as susceptible to pregnancy as before.

Two Fatal Ruptures of Cesarean Scars. These cases, in patients of 33 and 28 respectively, are placed on

record by J. L. De Courcy.⁸ The first case is exceptionally interesting because of the early rupture and its occurrence at the end of the 8th month. The second is interesting because of the long period (6 years) since the previous section.

In each of these cases, the incisions in the abdomen were unusually large for the Cesarean operation, and although the tears in the uterus may have extended beyond the previous scar, they were unusually long, extending well over the posterior surface of fundus.

In these cases it was impressed on De Courcy that a comparatively small incision into the uterus is of advantage, and also that when a second operation is considered advisable in a patient having a Cesarean scar, the operation should be performed not later than the end of the 8th month. For the life of the child will not be jeopardized, and the possibility of rupture up to this time is comparatively small.

[Altho' most writers claim the method of suture has little to do with the liability of subsequent rupture of the scar, the Editor believes more attention should be paid to the closing of the uterus, and broad surfaces of muscle should be brought into close apposition by means of many rows of small closely-set stitches. To avoid the danger of rupture in all cases where possible, the newer sections—the cervical should be chosen.—ED.]

Surgical Operations During Pregnancy. W. G. Gewin⁹ is of the opinion that intervention during pregnancy is not inevitably injurious, nor is the interruption of pregnancy a certain consequence.

It has been his experience that if confronted with an abdominal condition requiring *immediate* operation, this is principally required to save life; therefore, it is usually that much more drastic when two lives hang in the balance. And the danger of abortion, imminent though it may be, is a secondary consideration; many times the danger is quite as great if the patient remains undisturbed.

Owing to the fact many people shrink from operation until an emergency forces it, the patient often suffers

(8) Jour. Amer. Med. Ass'n., March 23, 1918.
(9) Amer. Med., March, 1918.

from some chronic trouble, prior to pregnancy. One attack of appendicitis predisposes another. She is very apt to think the sudden pain, and other accompanying symptoms, due to some disorder of pregnancy—especially miscarriage—and it behooves the physician to have other things in mind as well.

It is possible for gonorrhreal infection of the tubes and ovaries to occur months after the initial introduction into the body. Acute salpingitis is, at any time, from Gewin's viewpoint, a condition demanding immediate surgical treatment. There is the same chance for recovery as in the non-pregnant woman, and every probability of freeing her from even graver danger.

One of the strongest causes for operation during pregnancy is ovarian tumors. In the great majority the progress of the pregnancy will not be materially influenced by operation. Ovarian tumors are removed before they attain a size which will be sufficient to cause any symptoms attributable to pressure.

Torsion of the uterus is perhaps more common than is usually believed, thus causing enough disturbance of the circulation to bring about abortion.

The prognosis as to the mother, in cases of ovarian tumor, depends largely upon the location of the tumor, which is of much greater importance than its size, as a small tumor is very apt to occupy the pelvic cavity, causing an obstruction to labor.

After the presence of the tumor is ascertained, there should be no further delay. Not only is the new growth a usurper of space, or an impediment to labor, but the progress of pregnancy seems to be a factor in suppuration of ovarian cysts. Twisting of the pedicle, rupture and suppuration, may be expected to occur in three-fourths of the cases. The operative risk is no greater than in the non-pregnant woman, while the chances for the child are immensely improved by the removal of the mass which might cause great obstruction.

[With the exception of the case of appendicitis, the Editor does not agree with the writer regarding the absolute necessity of operation in all the instances cited. Often, under proper supervision, a temporizing policy is justifiable.—ED.]

Salpingo-Oophoritis Complicating Pregnancy. In addition to 12 personal cases, A. Brindeau¹ has collected 81 more, but only 44 were operated on. In most lesions the condition was already present at time of conception, as a rule old infectious annexitis prevents fecundation. In some, however, gestation may be the cause of complications, some of these are mechanical merely,—pain, adhesions, uterine displacements, twisting of the tube. More important are the septic ones, these occur in 31 per cent. at the beginning of gestation, or at the end of labor and the puerperium. The delivery, whether it be abortion or labor, often sets up an acute complication, this may take the form of inflammatory attacks of the annexa or of the periuterine cellular tissue, or (most often) of general peritonitis, with a quick and usually fatal course. Brindeau believes the treatment of these various complications must be surgical, and employed all the more quickly because the patient is pregnant. It is the best means of saving life and allowing the pregnancy to continue to term. If the patient has expelled the product of conception she should be treated as if suffering from a complication arising during the puerperium. If the infection appears to be localized or tending to do so, it is permissible to wait, but always in a prepared attitude; operation may then occur later. If, however, there are signs of general peritonitis, one must act quickly.

Of the 44 operations, death occurred in 6 (14 per cent.). No mortality followed 11 double castrations and 5 excisions of tube and appendix; in 10 salpingectomies there was 1 death; in 4 hysterectomies, 2 deaths; the other fatal issues were due to colpotomy, 2; and 1 laparotomy.

Bilateral Oophorectomy in Pregnancy. This case which throws some light on the effect of removal of both ovaries on gestation, is contributed by L. Stropeni.² The patient, aged 22, was married at 15 1/2, up to that time she had not menstruated, but 4 months later had a reddish discharge succeeded by pregnancy, a 2d preg-

(1) Arch. Mens. d'Obstét. et de Gyn., 1917, i, p. 1.

(2) Ann. di Ostet. e. Ginec. (quoted by Edinburgh Med. Jour., October, 1917).

nancy soon followed, both ending in normal labors, puerperia and lactations. Seen by Stropeni she was about 4 months advanced in a 3d pregnancy. Examination revealed a hard, smooth, movable, and painful mass near the left ovary and about the size of a mandarin orange. In a few weeks the mass was as large as a fetal head and the uterus was pressed to the right. The tumor was regarded as a dermoid cyst, and in view of possible complications it was decided to open the abdomen. The left ovary was removed, and as the right one was also affected and situated in the pouch of Douglas it, too, was taken away. The growths were found to be of the nature of luteinic sarcomata. The pregnancy continued. Soon, however there were various nervous phenomena, pointing to ovarian inadequacy, and ovarian extract was given. Thereafter the gestation went on uneventfully, and a large well-developed infant was quickly and easily born. Milk was defective at first, but soon became sufficient. This case shows it is possible to remove both ovaries in a pregnant woman (at any rate after 4 months) without necessarily interrupting the pregnancy. No support is found for Fränkel's view of the importance of the corpus luteum. All the more striking is the fact that symptoms of ovarian insufficiency occurred, proving Fränkel's suggestion of a third ovary could hardly be entertained. After a short preliminary failure the mammary function was performed normally, notwithstanding absence of the internal secretion of ovaries.

[In two cases in which the Editor removed ovarian cysts bearing the corpus luteum, in spite of the fact that one-half of the corpus luteum was implanted in the broad ligaments, and also, of the administration of ovarian extract, abortion occurred. In another case abortion followed after double ovariectomy.—ED.]

Laparotomy During Pregnancy. W. Nagel³ gives the details of 4 laparotomies performed during pregnancy, 3 of which did not interrupt gestation. In the fourth the fetus died 2 months after intervention, but a paternal syphilis seemed more probably the cause.

(3) Berlin. klin. Woch. (quoted by Med. Record, May 11, 1918).

Two cases were ovarian tumors, one a subserous fibroid and one a pyosalpinx. The writer concludes that all ovarian tumors should be removed at the beginning of pregnancy and if discovered later on operation should be deferred until the fetus is viable. As to myomata, they can often be removed without causing interruption of gestation, and Nagel opines to their removal when of the subserous variety and seated low down so they would interfere with delivery, or when on account of a long pedicle they can drop into the pelvis. The same applies to peritonitis close to the fibroid.

Strangulated Ovarian Cyst Complicating Pregnancy. At a meeting of the N. Y. Obstetrical Society, this case was reported by E. G. Langrock.* The patient, a primipara, of 24, was first seen March 17, for an attack of right iliac pain with vomiting. She had several similar attacks, diagnosed as appendicitis. Vaginal examination revealed an early pregnancy and, as the woman was desirous of having the baby and the appendicitis was not particularly urgent, she was advised to wait until after delivery unless she should have another attack. From this time her pregnancy was uneventful until Oct. 7, when she had another attack. There was slight tenderness in the lower quadrant but no rigidity and no mass could be felt either abdominally or vaginally. Four days later the pain became very severe, temperature rose to 101° F. and pulse to 104. The blood count showed 19,000 white cells, 89 per cent. polymorphonuclears, and 11 per cent. mononuclears. Appendicitis was diagnosed and operation decided upon. A cystic mass the size of a large grape fruit was found. This was accidentally ruptured and a large quantity of bloody fluid escaped. The cyst was tightly pressed against the abdominal wall by the pregnant uterus and in this manner there was interference with the circulation. The pedicle extended to the right ovary. The inner surface of cyst was hemorrhagic throughout. The appendix was acutely inflamed and was removed. The patient was delivered of an 8 1/2-pound baby on Dec. 25, and had a normal puerperium.

In the discussion G. L. Brodhead related the history

of a patient referred to the Harlem Hospital. In this case operation revealed a large cystic mass extending to the right hypochondrium and having a pedicle going to the pelvis. The pedicle showed three distinct twists.

[The Editor removed an intraligamentous ovarian cyst the size of a cocoanut, at the 5th month of pregnancy. Excessive vomiting ceased at once. Patient went to term.—Ed.]

Three Cases of Ovarian Cyst With Twisted Pedicles. All of these were seen by J. O. Polak⁵ within 3 weeks; and all were on the left side, perhaps due to torsion of the uterus toward the right. All were primary cases with definite familiar symptoms—sudden abdominal pain and nausea, subsiding under morphia and rest. The condition may go unrecognized at the first attack. Hence after a day or so, the patient got up, resuming her duties and has another attack, the twist increasing the size of the tumor. All the tumors were removed, and all went on with the pregnancy uninterrupted, which was beyond the 4th month when the corpus luteum has fixed the structures within the uterus. Such conditions occurring at that time have no effect on the pregnancy.

Obstruction of Outlet by Osteoma of Pelvis. J. N. West^{5a} had under his care a patient, aged 25, 3 months advanced. Some 2 years previously she noticed a small lump, hard and painless on bone to left of vagina. Examination showed a hard mass arising from ramus of pubes and ischium, and almost obstructing the outlet, growing forward and inward; having, apparently, beneath the skin numerous sharp excrescences. Wassermann negative.

Operation March 27, incision over the mass from the body of pubes down along the mass to the tuber ischii. The material was found to consist of a very irregular, spiculated, spongy, osseous structure. With a large rongeur this was cut away until the whole descending ramus of pubes, part of the body of pubes and the ascending ramus of the ischium and part of the tuberosity were removed.

(5) Amer. Jour. of Obstet., June, 1918.
(5a) Ibid., February, 1918.

Oct. 30 she was confined, labor normal. Examination 10 weeks after confinement showed a firm, fibrous band extending from the body of pubes to tuberosity of ischium. No impairment whatever of locomotion and no evidence of any return.

Obstetric Difficulty Caused by Large Angioma of Liver. I. C. Rubin^{5b} had occasion to operate on a patient aged 33, who had borne 13 children, 4 twin pregnancies. During her last gestation her abdomen had increased so markedly she considered herself again pregnant with twins. The abnormally large size with increasing discomfort and then pain led to an induction of premature labor. The presence of the tumor then became obvious. The diagnosis of ovarian tumor was made chiefly because of its location and the findings on bimanual examination. On laparotomy it proved to be a giant-sized (24x16x4 in.) pedunculated cavernous angioma of liver, was easily removed without hemorrhage. Recovery uneventful.

If Rubin had paid sufficient attention to the percussion signs, namely, dulness in the right hypochondrium continuous with liver dulness he might have ascribed the origin of the tumor correctly to the liver and not to the ovary. However, the great rarity of tumors of this variety and the greater frequency of ovarian tumors complicating pregnancy would favor the latter as the most probable diagnosis.

[Those who have attempted to diagnose abdominal tumors complicated by pregnancy will readily excuse Rubin's error.—ED.]

Influence of Pregnancy on Cancer. W. S. Bainbridge⁶ gives details of two cases in patients, aged 38 and 30 years. He states pregnancy increases the rapidity and growth of coexistent cancer. If, as some contend, there is a retardation—rapid increase may follow delivery. While the stimulating effect of pregnancy is exerted more markedly on the organs directly concerned with the pregnant state, cancer in any other part of the body, *e. g.*, orbit and face (Case II) may be influenced in like manner.

(5b) Amer. Jour. of Obstet., February, 1918.
(6) Ibid., January, 1918.

If the cancer is removable, in order to secure the best chance of permanent cure, the pregnancy should be terminated regardless of any consideration for the child. Even in advanced cases of malignant disease, in which there is no hope of cure for the mother, it is a question whether she should not be afforded whatever chance of prolongation of life, and more important, mollification of symptoms—abortion may give.

Cancer of Cervix Complicating Triplet Pregnancy. At the meeting of the American Gynecological Society, B. P. Watson⁷ reported this case, which occurred in a V-para, aged 30. A large mass was found growing from the portio vaginalis. At abdominal Cesarean section, three 5-month fetuses were extracted with three separate placentas connected by membrane. Ries-Wertheim operation done; good recovery.

Pregnancy in Uterus Didelphys. The gravid cornu became twisted and the apoplexy of the uterus and placenta from the torsion compelled operative relief. E. Mazzini⁸ expected to find merely premature separation of the placenta with internal hemorrhage, having overlooked the spiral folds and crevices in the cervix which should have warned of the torsion. The parts had suffered and the gravid cornu and its adnexa were removed. Conditions appear propitious for future pregnancies as the half of the uterus left, with its adnexa, seem practically normal.

Pregnancy in Bicornuate Uterus. H. A. McNally⁹ saw a patient, aged 37, in her first pregnancy, though married for 11 years. She first menstruated at 13, had extreme pain at her periods, which were always regular. The most painful time was before the flow. About 2 years before, McNally found her in extreme pain in the pelvic region with a small rapid pulse and the appearance of collapse. She had not missed a menstrual period, but the flow was now so slight he thought, when finding a lump on the right side of the pelvis, of tubal pregnancy and closely watched her for a few hours, to be surprised at finding it clearing up.

{7} Jour. Amer. Med. Ass'n., June 22, 1918.

(8) Semana Med. (quoted in Jour. Amer. Med. Ass'n., April 6, 1918).

(9) Canadian Med. Ass'n. Jour., September, 1917.

A further examination led him to diagnose an ovarian cyst. From this time on her periods were not so painful, although there was an occasional severe one.

The woman became pregnant and at what would seem the 7th month had labor-like pains which quieted. The next month labor-like pains continued to worry her for several days. On the day of delivery, which took place about 6 p. m., pains were regular and strong, with each pain the firmly contracting uterus could be distinctly felt on the left side of midline. The presenting head could be felt through the external os, which was now well dilated, and a perfect male child was delivered by forceps. The os allowed easy access to reach at once the placenta and explore the cavity. That thought to be the head of a second child was the second horn of the uterus with a cavity big enough to admit a good sized hand.

The painful menstruation was due to retention within the smaller horn. The supposed cyst was the main body of the uterus lying to the right of midline, while the second horn was nearer the correct position of the normal uterus. This is the first double-horned uterus which McNally has recognized in 25 years of obstetric work with much surgery.

Diabetes and Obstetrics. Caldwell and Bibb¹ advise that each case of pregnancy with glycosuria, even though the symptoms are severe, should be given Allen's alimentary treatment, with such other measures as are necessary and labor be not terminated, as set forth in many textbooks, unless the amount of sugar remains fixed or increases after such treatment and the general condition grows progressively worse because:

(A) Under the present-day treatment some very severe cases of true diabetes have been cured. (B) A natural abortion if it comes, or a Cesarean, is no more dangerous than a provoked emptying of the uterus. One may therefore wait until the condition of the mother demands this procedure. Normal delivery seems to be as bad for the pregnant diabetic as section, so this operation need not be avoided but may sometimes be actually the choice.

The idea that alimentary rest increases acidosis to a marked degree is losing ground. The administration of alkalies by mouth or intravenously will many times control the acidosis. One case of diabetes under treatment by the authors for more than a year had been given very large doses of bicarbonate of soda by mouth, *i. e.*, a heaping tablespoon *t. i. d.*, without reducing the acidosis; but following the first injection of bicarbonate into the vein (1 dram in 250 c.c. of distilled water) it disappeared.

Heredity undoubtedly plays an important part in many cases. Bibb observed a family where a grandmother, mother, son and twin daughters died of diabetes. The mother and son died in coma. The daughters developed the disease at about the 7th month of their third pregnancy. Each bore a healthy, robust child—one a son, the other a daughter. These 2 daughters became confirmed diabetics, but remained sterile thereafter.

[In all cases of glycosuria blood tests should be made to rule out renal diabetes. A true diabetes is a serious complication of pregnancy, both for mother and child, and requires most careful watching by an Internist, together with the Obstetrician.—ED.]

Albumosuria in Pregnancy. In Tanberg's² case, a III-para in the 7th month, had felt ill during the entire gestation. She vomited constantly, and by the 6th month complained of the degree of abdominal swelling. Her symptoms soon became aggravated as edema and oliguria developed with albuminuria. Diet produced no improvement. Fetal movements no longer perceptible, and in a few days a still-birth occurred, after which all symptoms improved at once. The urine passed on admission contained albumose, though free from albumin. In a few days albumin also was present but vanished on the 4th or 5th days post-partum, while the albumose persisted for 10 days.

(The patient has since gone through pregnancy without discomfort and bore a full-term child.)

Heart Failure and Pregnancy. In a preliminary ac-

(2) Norsk Mag. f. Lægevidensk. (quoted in Amer. Jour. of Obstet., June, 1918).

count, Sir J. Mackenzie³ states heart failure is essentially a question of myocardial efficiency. He describes the force possessed by the cardiac muscle as of two kinds, a force which maintains the circulation when the body is at rest—the rest force; and one called into play when effort is made—the reserve force. Heart failure begins by the diminution of the reserve force, and is manifest by a limitation of the power to respond to effort. All failing hearts show a limitation of the field of cardiac response—the first sign being the consciousness that certain efforts which the patient used to undertake with ease now give rise to distress. But healthy hearts may show these signs when there is added pregnancy, for the condition then resembles an individual undertaking an effort with an impaired heart. Many practically healthy hearts burdened by pregnancy show distinct signs of inefficiency, and yet there is no danger. The notion that the left ventricle hypertrophies in pregnancy is not based upon trustworthy evidence. What does happen in every healthy woman is a diminution of the reserve force, greater in some than in others. A careful investigation in 100 women before pregnancy, during pregnancy, confinement and the puerperium, showed no evidence of that hypertrophy. As the growth of the abdominal tumor proceeded the diaphragm was pushed up, sides of the chest widened, and heart displaced up and to the left. With the emptying of the uterus the position shifted to the normal one.

While the exhaustion of the reserve force gives rise to the same symptoms whether it is a healthy heart overburdened or one failing from disease, it is the extent to which the signs of cardiac inefficiency go and the progress of the failure which serve as a guide. The most striking phenomena of the progress of failure are the onset of dropsy, breathlessness gradually increasing till the patient has to sit up, edema of the lungs, and persistent increase of rate or violent beating of the heart on exertion.

Dropsy frequently occurs in pregnancy from other causes than heart failure—in kidney affections, and from pressure of uterus upon the abdominal veins. It must

not of itself be taken as an indication of a failing heart, but only when there are present the other symptoms of failure. When orthopnea is reached in heart failure the sooner premature labor is induced the better. Edema of the lungs is probably the most reliable guide. MacKenzie began the examination of the patient by finding out on which side she lay, and then had her sit up, and auscultated the base of lung on that side. In many healthy women during the later stages of pregnancy the first deep inspiration was accompanied by numerous crepitations, and the inspiration dispelled them. In cases that did badly these crepitations tended to persist, so their continual presence, with an impaired percussion note, is such a grave sign as to indicate the need for terminating the pregnancy.

Termination is indicated in mitral stenosis when edema of the lungs persists in spite of sitting up in bed or the heart-rate is persistently over 100 with violent palpitation on the slightest effort. The dangers in aortic regurgitation are so great and yet so difficult to anticipate that he would recommend the termination in all cases with a "Corrigan" pulse, and when there is a distinct forcible apex-beat outside the nipple line.

Marriage and Pregnancy in Cardiac Disease. Views regarding the advisability of marriage in women with cardiac disease are quite at variance. *E. g.*, some maintain that such patients should never marry, no matter what type of lesion. S. Neuhof⁴ believes this view to be extreme. One frequently encounters mothers of large families who have had valvular disease for many years. Many were never aware of their disease: in some the lesion was discovered only by a routine examination.

Marriage naturally should not be advised, if the patient shows the slightest degree of decompensation—evidenced by dyspnea, especially on exertion; edema of the extremities; enlarged liver; bronchitis; cyanosis, and by arrhythmias. However, these last in themselves (except possibly auricular fibrillation) do not necessarily indicate either heart disease or decompensation. In those who have only recently recovered from heart failure, it is a safe rule to interdict marriage until at least

two years have passed, without any further break in compensation. An exception is noted with reference to aortic lesions and extreme cardiac hypertrophy. The interval mentioned is, of course, purely arbitrary, but seems to agree best with clinical experience. In valvular lesions the same time should be set as a safe interval in which no inflammatory symptoms have occurred.

Of the two factors, decompensation and quiescence of the lesion, the latter is the more important. Gestation seems to light up dormant or only partially active cardiac processes.

Patients with simple mitral regurgitant lesions are the most apt to go through gestation without untoward complications. When the latter do occur, they are more often of the mild decompensatory type from recurrence of the endocarditis. Those with aortic lesions suffer chiefly from tachycardia. This is true of those with, as well as those without marked ventricular hypertrophy. In the latter, however, tachycardial attacks occur more frequently, are more readily invoked and of longer duration. Decompensation is comparatively rare in those with only moderate or slight hypertrophy; when extreme, cardiac failure is apt to occur early in pregnancy, a tendency increased by the rapid heart action. Such patients should be advised against marriage or if already married should not become pregnant even if the lesion is quiescent and compensation good.

In all decompensated endocardial lesions, the question of abortion or of premature labor arises. Severe cardiac failure before the 4th month, or slight decompensation which does not yield to treatment, is an indication for immediate emptying of the uterus. This is not vitiated by the fact that some mothers may, by protracted rest and medication, carry the child to viability or even to full term without further complications. The life of the mother should not be jeopardized, as it would be, in an attempt to continue the pregnancy when decompensation is present in early gestation. Neuhof's observation has been that an abortion, surgically clean and skilfully performed, is only slightly, if at all, more dangerous in cardiac patients than on those with normal hearts. He is also strongly in favor of

terminating an early pregnancy if it is evident there exists a continuance or recrudescence of endocarditis.

If the signs of decompensation, or of fresh endocarditis, appear between the end of the 4th month and the time of viability, in view of the somewhat more serious operative procedure required, the decision regarding interruption of gestation hinges chiefly upon the severity of the cardiac complications. If decompensation is mild or the evidence of fresh endocarditis not severe, appropriate therapy should at first be attempted for about 7 or 10 days. Should the symptoms then disappear and the patient improve, pregnancy may be allowed to proceed until viability, possibly until normal labor. If decompensation or endocarditis does not react well to therapy or becomes suddenly threatening, it is much safer to induce miscarriage.

Between the 7th and 9th months, the decision regarding the interruption of pregnancy is less vital, because the premature induction of labor in proper hands adds scarcely any risks. The question of waiting a month or two until normal labor occurs must depend upon the cardiac condition; *i. e.*, if there is any reason to fear the slightest increase of complications, it is safer to have pregnancy terminated soon.

Pregnancy Complicated by Severe Cardiac Lesions. G. Gellhorn⁵ summarizes his views on the management as follows: Only a comparatively small percentage of women with cardiac lesions, who are pregnant, suffer a decided deterioration of their condition. But such patients may become critically ill from loss of compensation and require the most attentive care. The individual physician hardly has the opportunity to acquire extensive personal experience with this class, but, when he turns to his textbooks, the advice he finds is all too meagre. Practically all our recent American books omit mentioning the cardinal value of vaginal and abdominal section, and none acknowledge the particular value of spinal anesthesia.

[Regarding the important question of abortion in cardiac decompensation many factors, not purely medical must be considered—the religion of the patient, her

family status, her ability to procure care and provide care for her dependent children, etc.

As a rule, the Editor does not approve of abortion even in marked cases of heart disease—because by proper medication, and especially by rest in bed, the mother can be safely carried along at least till the child is viable—in the majority of cases. When the child is surely viable, an abdominal Cesarean section done under novocain is the quickest and safest method of delivery. The tubes may also be excised to procure sterility.—ED.]

Pregnancy and Pulmonary Tuberculosis is discussed by Norris and Landis⁸ based on 85 cases at the Phipps Institute, and 18 from Norris' practice.

It is a well recognized fact that this disease not uncommonly first manifests itself during pregnancy or shortly after birth of the child. Why a tuberculous process should become active during pregnancy is not altogether clear, unless from an added strain on the woman's resistance. In the cases following confinement, the violent exertion is commonly accepted as the probable cause of arousing to activity a latent lesion. Among the women in the White Haven Sanatorium at present there are 29 who have borne children; of this number, 6 date the onset of their tuberculosis from a pregnancy or shortly after birth of a child.

Furthermore, the large number of child-bearing age who die of tuberculosis annually makes it apparent that during this period the combination of tuberculosis and pregnancy is always a possibility. Unfortunately, unless the woman has definite pulmonary symptoms when she consults her physician, little thought is given to her respiratory system. Many who first manifest tuberculosis at this time give a history of a small hemoptysis, an attack of pleurisy or other symptoms in the past that renders the possibility of latent tuberculosis very strong. Failure to acquire this knowledge, or to give such information due consideration not infrequently leads to disastrous results.

Of Norris' 18 patients, 5.55 per cent. were apparently improved; 22.2 per cent. unchanged; 61.11 per cent. worse and 11.11 per cent. died either during preg-

nancy or the puerperium. These figures coincide closely with those in the literature, but are not in accord with those observed at the Phipps Institute, where in 85 cases, two patients were worse and six died, or about 10 per cent. in which the pulmonary lesions were aggravated. Why, then, is this apparent discrepancy? Most women are delivered either by the general practitioner or the midwife, and only a relatively small proportion seen by the specialist. The specialist is called in consultation in the worst cases, and such cases are likely to be sent to hospitals for delivery, where again they fall into the hands of the obstetrician. Thus he is especially prone to see patients who are doing badly, and this is doubtless a factor in the high mortality and morbidity usually reported.

Prior to the 5th month, the uterus should be emptied if the disease manifests evidence of becoming active, if the lesions are extensive or laryngeal involvement occurs. Curettage during the first 6 or 8 weeks, and in the latter cases vaginal hysterectomy, are the preferable methods. Interruption of pregnancy does not insure an amelioration of the pulmonary condition, but does definitely improve the prognosis. After the 5th month, it is generally advisable to treat expectantly. Labor should be made as easy as possible. For this end, induction of premature labor two weeks before term is often advisable; rarely, if ever, should they be allowed to go beyond term. At labor, forceps or version is usually indicated.

Infants should not be nursed by tuberculous mothers, and should be especially guarded from infection.

[The Editor holds views regarding abortion in the treatment of pregnancy with tuberculosis different from those regarding heart disease. The mass of evidence and testimony is in favor of emptying the uterus in cases of pulmonary tuberculosis—in the early months. Therapeutic abortion can be done without an anesthetic, or under novocain—the woman given the usual (and, nowadays, very successful) treatment for the disease, and 3 years afterward may be allowed to conceive and rear a family.

The Editor is convinced that this course, in the long run, will produce more babies for the State than the few that will be gotten from actively tuberculous mothers, who die shortly after delivery and who, while actively diseased, implant the germs of tuberculosis in their offspring.—ED.]

Pregnancy in Pulmonary Tuberculosis. J. Walsh⁷ claims pregnancy does not exert the harmful influence that is alleged. Some 38 patients who were observed within fifteen years gave birth to a total of 50 children. Only 5 mothers died. His experience is at least as favorable as that of authors who practice abortion, sterilization, etc. Many children were saved who otherwise would have been sacrificed before viability.

His conclusions are: Active cases should be advised against marriage; quiescent cases especially after treatment and education bear the duties of marriage sufficiently successfully to warrant the risk. Patients with quiescent conditions, if pregnant, are to be placed upon a rigid regimen and may be expected to come through with but little, if any, advance of the tuberculosis. Those with active tuberculosis, if they become pregnant, run a definite risk, but the operations for abortion, especially associated with sterilization, have a mortality making the continuation of the pregnancy more desirable as well as safer. [?—ED.]

Pregnancy and Tuberculosis. Forssner⁸ states the number of his patients in the 1st stage was 243, and 154 were under observation at least two years. Of the gross total, 196 were examples of stationary and 18 of advancing tuberculosis, while 29 are dead. The total number of gravidae in the 2d stage was 151, of these 102 were followed up for at least two years, 85 patients had the disease in the stationary—and 7 in the progressive stage—while 59 are dead.

The total number of gravidae in the 3d stage is given in one table as 22, in 9 of whom the disease was stationary, the others are all dead. In another table, 82 cases are contrasted with 100 from Krönig's clinic.

(7) Amer. Jour. of Obstet., February, 1918.

(8) Finska Lak. Hand. (quoted in Amer. Jour. of Obstet., May, 1918).

While 43 Swedish women out of 82 were in the 2d and 3d stages, their disease was stationary in 29. Of 27 German women in these two stages, the disease was stationary in but 7.

Pregnancy in the Tuberculous. From his own experience and the data on record, R. A. Menendez⁹ concludes that induced abortion gives good results only when there is a simple tuberculous process at the apex, not extensive and not complicated with other lesions, and the pregnancy has not reached the 4th month. When abortion is not practicable, excision of the site of the placenta or hysterectomy after delivery does away with the dangerous secondary focus in the placental region.

Treatment of Vomiting of Pregnancy. C. R. Hannah¹ for the past few years has used this treatment: (1) Insist upon the patient taking her breakfast in bed and remaining there an hour or so. (2) Eat whatever she wants at any time during the day and even immediately after vomiting. (3) Make a thorough vaginal examination. If she is normal, let her alone. (4) Give large doses of sodium bicarbonate (1 dram to 8 oz. of water) six times daily.

J. M. Newman (New Orleans) advises:

"That the most important of all the treatments combined is the use of horse serum." Proceed as follows: "Inject in the lumbar region subcutaneously (just like using any other serum) 1 c.c. of normal horse serum and wait for any anaphylactic reaction; should this appear within three or four hours do not proceed further; if, however, no reaction takes place, then inject the remaining 9 c.c. In desperate cases I give 5 per cent. glucose solution intravenously (one quart) and allow the serum to run in at the same time. The patient usually shows marked improvement after 24 hours and convalescence is rapid. If, however, improvement is only slight, I would advise repeating the serum in three or four days, provided, of course, everything else is normal."

Treatment of Hyperemesis With Ovarian Extract and Corpus Luteum. Since October, 1915, P. J. Carter² has had 20 consecutive cases, without a single failure. The duration of vomiting after beginning the treatment

(9) Cronica Med. (quoted in Jour. Amer. Med. Ass'n., July 6, 1918.)

(1) Texas State Jour. Med., August, 1917.

(2) New Orleans Med. and Surg. Jour., September, 1917.

averaged 10 days, with extremes of 1 and 14 days. He does not contend that ovarian extract or corpus luteum will cure every case, but it will largely control those of the toxic type. Carter's experience with Copeman's method and the bimanual replacement of a displacement, have not been very encouraging.

With limited experience, he gives the ovarian extract alone where there is not incessant vomiting, and the stomach will tolerate it. It seems to give the quickest relief, and patient is not annoyed by repeated use of the hypodermic needle. When the patient vomits everything, then rely upon corpus luteum by needle. As patients object to the needle, and the lengthened time, to get results with the corpus luteum, he begins ovarian extract as soon as the stomach will tolerate it. Corpus luteum has been a life saver in cases in which vomiting was incessant, and should be administered as long as the patient is in such a perilous state.

The literature is extremely scarce. J. C. Hirst gives a preliminary report of five cases with 80 per cent. success. In these he administered corpus luteum only and by needle. Later on he was able to add a few more cases, which increased his percentage to 84 per cent.

The smallest dose used in this series of cases numbered four; largest, forty-two; average, eleven.

[The Editor has used corpus luteum by mouth in perhaps one hundred cases of pregnancy vomiting, and can report very few successes. Recently, on Dr. Hirst's advice, he is using it hypodermically, and finds as many improve as are unaffected by it. Whether it cures, therefore, is a question.—ED.]

Feeding in Hyperemesis. We have 3 methods of normal feeding at our disposal: subcutaneous, intravenous and rectal. The principle that should guide us is to give all the necessary food elements if possible. If it is not possible, writes J. B. Bacon,⁴ to give a sufficient quantity of nitrogenous foods, we should give energy foods which save the tissues.

Rectal feeding remains the most practicable and, when properly given, is efficient. All essential food elements can be supplied—water, salts, glucose, amino-acids and

vitamins. The deficiency in nitrogenous foods can be made up in part by giving an excess of glucose and by alcohol. Sedatives can be added as needed. No attempt should be made to give undigested proteins. Amino-acids and peptones dialyzed from artificially digested meat or milk may be given. Sugar and starch digestion does not take place in the colon, so carbohydrates should be given as a monosaccharid, preferably glucose, which is absorbed without change. As the absorption of fats is doubtful, they should be omitted.

Solutions of vitamins from the pancreas or other sources should always be added if the feeding is to be continued for a considerable period. An energy food of great importance in rectal feeding is alcohol. If given in not more than a 5-per cent. solution and not to exceed 100 gm. a day, it is practically all consumed and harmless. The great importance of calcium makes it desirable to add a calcium salt to the injection. The constant acidosis indicates sodium bicarbonate. To diminish the central reflexes, sodium bromide may be substituted for the basic salt sodium chloride in sufficient amounts, generally from 3 to 4 gm. per liter.

The solution should be at body temperature. It is necessary to warm the tube just before it is joined to the rectal tube by hot sandbags. The rate of one drop a second is nearly always tolerated, if the rectum and colon have been properly prepared. A large enema of at least 1 liter should be given every day to remove particles that continue to come down. This enema also should be a hypotonic solution, *e. g.*, 5 per thousand of sodium chloride, in order some water may be absorbed. A small amount of alcohol, 1 per cent., may be added in the hope that nutriment may be supplied in this way. The cleansing enema may be given at 7 or 8 a. m. Then the nutrient enemas would start at about 9 a. m., 2 p. m. and 7 p. m. Sometimes it will be found desirable to add 10 drops of tr. of opium to the evening enema.

The composition of the rectal feedings will have about the following proportions: glucose, 50; alcohol, 50; calcium chloride, 0.3; sodium bicarbonate, 3; sodium chloride or bromide, 4; vitamin *q. s.*; distilled water, to make 1,000. From 300 to 500 gm. are to be given *t. i. d.* This

mixture has an energy value of about 550 calories. If 1,500 c.c. are given each day, the patient will receive 825 calories. In two or three days the retching stops, thirst disappears, and patient is fairly comfortable.

It now becomes difficult to determine when stomach feeding may begin. As a rule, it is better to be cautious than hasty. Lavage of the stomach is frequently very desirable before beginning oral feeding. The foods best taken are generally some forms of milk. Egg albumin is added early. Rectal feedings are discontinued gradually and not until the stomach feeding is reestablished. The patient should be kept until control until the 16th or 18th week, as relapses are not uncommon.

[It is highly desirable that these scientific recommendations should supersede the haphazard methods of rectal feeding usually practiced.—ED.]

Serotherapy for Uncontrollable Vomiting. A number of striking cases have been reported, and R. F. Melgar⁵ adds 2 more: He injected 10 c.c. of serum from a healthy pregnant woman, near term, following with a 2d or 3d injection of 15 or 20 c.c. at two or three day-intervals. One patient was a primipara of 22, the other had borne several children, and in both the vomiting was rebellious to all other measures. The improvement was pronounced in a few hours. The pulse grew slower, the vomiting less severe and less frequent, and disappeared completely by the third day. Melgar cites further 3 cases in which normal horse serum cured a dermatitis or incoercible vomiting in a pregnant woman, but he had no success in the one case in which he used it.

Case of Hemimelus. A II-para, aged 22, under the care of T. M. M. Flynn⁶ gave birth to a 7 1/2-pound boy, which, apart from the partial agenesis, seemed robust. The usual depression at the base of the nose was markedly accentuated, and in 8 hours the child developed "snuffles." Death on 5th day from pneumonia. Necropsy showed each humerus and femur perfectly developed, but entire absence of distal extremities.

(5) *Cronica Medica* (quoted in *Jour. Amer. Med. Ass'n.*, June 29, 1918).

(6) *Pennsylvania Med. Jour.*, December, 1917.

Family Prevalence in Anencephaly. These monsters are not uncommon, 14 per cent. of 325 cases (Ballantyne). Family prevalence, however, is rare, hence the report of a case by H. Thoms⁷ is of interest. The patient was 25, and in the 3d pregnancy. In the 1st and 2d, there was hydramnios, and labor terminated with expulsion of an anencephalic monster at 7 months. In the 3d labor, version was performed and a still-born anencephalic fetus with complete spina bifida extracted. A Wassermann of the maternal and paternal blood was negative. Microscopic examination of the placenta revealed no syphilis.

Full-Term Cyclops. A specimen of this malformation was delivered by A. W. Brigham.⁸ The presentation was by the breech. The child was unable to breathe, though the heart continued to beat for about 2 minutes. The mother, a colored multipara, aged 27, had had a living child, 2 years previous, no miscarriages. The present one, a female, was apparently normally developed, except there was one eye with a proboscis above it. Mouth smaller than normal, and bones of skull widely separated, showing some hydrocephalus.

Ischiopagus. An example of this was seen by W. Salmond⁹ when 7 days old. The mother, aged 27, had borne 2 healthy children. There was no special difficulty in the labor, and no physician was called. There were 2 perfect vulvæ, but urine only escaped from one. There were also 2 anal orifices, but likewise feces escaped from only one. Each mouth took food and the children cried independently. One would sleep while the other remained awake. The hearts did not beat synchronously, and the respiratory movements were independent. There was only one umbilical cord. There were normal movements of the 4 arms and of 2 legs. The third, or fused, leg had 9 toes. Death on 8th day.

[It is unfortunate that these united twins did not live longer. There are many interesting experiments and observations still to be made on such children, espe-

(7) Jour. Amer. Med. Ass'n., Jan. 5, 1918.

(8) Amer. Jour. of Obstet., January, 1918.

(9) Lancet, Feb. 23, 1918.

cially in the line of serology, and the endocrinial glands.
—ED.]

Chorio-Angiopagus. This case came under the observation of I. Ayora.¹ A unipara, aged 28, and mentally deficient, after 20 hours' labor, gave birth to the 2 fetuses and secundines by a single abrupt effort. He describes the specimen as follows:

Both females, weight 900 and 500 grams. One was rather edematous; the other resembles a fetus papyraceus. The cord of the smaller child was inserted in the membrane 1 ctm. from the placental edge, the other was inserted into the placental margin, 5 ctm. from the velamentous insertion. The cord of the smaller fetus had two parts, one reddish as if the circulation had been maintained until recently. The other portion was grayish, very slender, and twisted. It is probable the circulation up to the strangulation point was reversed and maintained by the other heart, the blood crossing the vascular anastomoses in the placenta. The cord of the larger child also presented two parts, one reddish and of normal thickness, the other twisted upon itself. Perhaps the larger fetus survived by 3 or 4 weeks (Plate X).

The placenta is 12 ctm. in diameter, 1.5 thick, and weighs 500 grams, which compared to the combined weight shows considerable development. The amnion forms a crestlike fold. On removal it exposes clearly the anastomosis of the arteries of one cord with those of the other, forming thereby an oval upon the placenta. Consequently a third circulation is clearly present.

The membranes are complete, with a single cavity which encloses the fetus and accommodates 1 ctm. of the smaller cord. The rupture is lateral. Without any great difficulty it was possible to separate the chorion from amnion.

ECLAMPSIA.

Prophylaxis in Eclampsia. W. H. Condit² contributes his experience at the University of Minnesota, where 640 cases were delivered the year ending Oct. 1, 1917.

{1} Surg., Gynecol. and Obstet., May, 1918.
{2} Illinois Med. Jour., December, 1917.

PLATE X.



Placenta from same case.—Ayora (see p. 196).



Case of chorio-angiopagus.

After seven years with but 17 cases of toxemia, they had 13 cases with one death in seven months. The fatal case was comatose on admission and never rallied, even after rapid emptying of the uterus. This record surely provides a subject for serious consideration. Condit concludes there is no doubt but there has been a large increase in the number per 100 of reported cases of toxemia of pregnancy during the past two years. Let us hope this is due to more efficient reporting, rather than to actual increase.

Blood-pressure observations give the first warning of an impending danger. Persistence of hypertension is the absolute signal for termination of pregnancy as a means of preventing convulsions or coma. Hypotension is a more common finding in the early months, but may also occur in later; is usually prophetic of shock or hemorrhage during approaching labor, but it may accompany a serious toxemia, in rare instances. Systolic hypertension of 150 mm. of mercury should be considered a danger signal, and close study for presence of other evidences of toxemia made.

Conservative treatment and use of bougies or the colpeurynter for inducing labor is to be chosen rather than accouchement forcé or hysterectomy.

While one attack of convulsive toxemia does not predispose to another, we may have superimposed a chronic nephritis, which, unless carefully supervised following an apparent recovery, may result in a permanently damaged kidney. Hence: "Do not discharge your patient from your observation too soon."

The Blood in Eclampsia. In eclampsia and allied intoxications, blood analysis showed amino-acids in normal amounts, while there was, according to J. M. Slemmons³ a slight retention of nitrogenous waste, *e. g.*, urea and uric acid. The sugar increases after convulsions, though fat is about the same in toxemia as in normal pregnancy. As a rule, the cholesterol is increased and the lecithin diminished in eclampsia. The CO₂ combining power of the plasma is reduced during normal pregnancy, showing a mild acidosis, and the variations in autointoxications are insignificant. He points out

that these results support neither the acidosis nor the derangement of protein metabolism hypothesis of eclampsia, and the cause must be sought elsewhere.

[The Editor has always held the suspicion that an infection will finally be found at the bottom of eclampsia. Clinically many facts speak for this theory. Owing to the dearth of assistants occasioned by the war, he has been unable to pursue a line of investigation started to discover this cause if it exists. Many bacteriologic studies of eclampsia have been made, but none with our latest, very efficient methods.—ED.]

Comments on Treatment of Eclampsia. For the purpose of his paper, R. W. Holmes⁴ categorically includes all states which are accompanied by abnormalities in the urine as of the pre-eclamptic period. When convulsions occur, we have actual eclampsia. This interpretation is distinctly incorrect as a scientific exposition, but it furnishes an adequate working hypothesis. *Until investigators furnish us with the basic etiologic factor—the essential poison—all our means of combating the disease are purely empiric.*

He presents a résumé of cases from the literature: the figures showing results for mothers are accurate and present a true basis of comparisons; those for the children are necessarily merely suggestive. Some writers count all alive at the moment of birth, others count as dead those who died within a "few days," and still others are dead if they died before the mother left the hospital, i. e., two weeks.

MOTHERS.

	No.	Deaths.	Per cent.
Expectant methods...	1795	335	19.0
Vaginal section.....	530	124	23.4 (Elimination)*
Abdominal section....	500	174	34.8 (Elimination)*

FETUS.

Expectant methods...	1270	503	39.6
Vaginal section.....	315	67	21.2 (Elimination)*
Vaginal section.....	530	282	53.3 (All infants)
Abdominal section....	381	25	6.5 (Elimination)*
Abdominal section....	500	144	28.8 (All infants)

*Elimination applies to the process of omitting many dead or premature infants—an artificial process.

We may state that treating a gestational or intrapartal eclampsia along the conventional lines, which may be denominated expectant methods, until labor has accomplished such dilatation that delivery may easily be terminated, offers the safest course for the mother, over Cesarean section, by from 4 to 15 per cent.: the same methods offer for the child a better future to the extent of 4 per cent. if a vaginal section be not done, and the same method is 11 per cent. less safe than an abdominal section. It is evident the more radical the operation for the delivery, the more dangerous is it for the mother, and may offer a slightly better chance for the child. A Cesarean section only should be countenanced when there are definite complications which may interfere with a pelvic delivery; in the main, pelvic contraction; even though not greatly contracted, such diminution may seriously compromise the success of an obstetric operation. Likewise, marked alteration of the soft parts, either congenital or acquired, may contribute a necessity. It is, indeed, fortunate that such anomalies are rare; mostly the writings of the great frequency of such obstructions to dilatation and delivery are based on inaccurate observation.

A summary of the most recent opinion on the treatment follows: Chloral hydrate 15 gr., with morphia 1/4 gr. In two hours the chloral is repeated, and in three or four hours the morphia. Thereafter, the two drugs are exhibited as often as the condition requires, this depending on the time the effects of the drugs wear off, or on the evidence of recurring aggravation of symptoms. At the same time, such methods are instituted as will tend to secure elimination (catharsis, diaphoresis, and diuresis). When the condition of the parturient canal permits it, then operative delivery should be accomplished. No chloroform should be given; oxygen should be given during the convulsion. How popular the expectant, non-surgical treatment will become, time alone will tell. However, it will have one beneficent influence in drawing attention to the fact that intervention is *not the treatment*, but merely an incidental detail.

After all is said and done, at the present time, the therapy of eclampsia is blindly groping in the dark.

Treatment of Toxemia in Pregnancy. Authorities are described by J. A. G. Hamilton⁶ as being divided into two hostile camps. One, the "conservative" or Rotunda school, believe the toxin is elaborated from the food taken, owing to some fault in metabolism. The English or Continental school, considers it to be due to the fetus, and that the symptoms are due to placental albumin finding its way back to the maternal blood in quantities greater than can be dealt with by the antibodies elaborated. It is on the presence of these antibodies that Abderhalden's serum test of pregnancy is based.

Those holding the first view advise little or no interference with labor, while to those holding the second, no methods are too radical, induction of labor, accouchement forcé, vaginal or abdominal section being each advised in particular cases.

The Rotunda treatment is as follows: The patient is put in a dark room, catheterized and blood-pressure taken. Three ctg. of morphine are injected, followed by stomach lavage and 60 c.e. of castor oil poured down the stomach tube, colonic irrigation of 22 liters of a 5 per cent. glucose solution or a 0.6 per cent. solution of bicarbonate of soda is given. If the pressure is 175 systolic, a sufficient quantity of blood is extracted to bring pressure down to 150 systolic. The patient is then kept quiet, and 0.015 gm. of morphine given as often as is necessary to control the fits. Members of the staff maintain that, under this treatment, the convulsions usually ceased and the patient delivered herself in a short time. Smyly, when he started the morphine treatment at the Rotunda, reduced the mortality rate in eclampsia from 35.3 per cent. to 20 per cent. Tweedy had 78 cases, with 6 deaths—or 7.7 per cent. Tweedy lays great emphasis on stomach and colonic lavage, and teaches very strongly that indigestible food is a most important exciting cause. He does not allow medicine of any sort to be placed in the mouth of an unconscious patient, but 60 c.e. of castor oil, with 3 drops of croton oil, are poured into the stomach just before the tube is withdrawn.

It seems to Hamilton that the chances are improved

by the emptying of the uterus. This removes the fetus and placenta, which are generally believed to be in some way the cause of the toxemia. If the patient is in labor, the process should be hastened as much as is consistent with safety. If she has reached the second stage, forceps should be applied, but before anything is done, the membranes should be ruptured. This rapidly diminishes intra-uterine tension and reflex irritation. If she should be in the first stage and cervix is easily dilated, manual dilatation can be employed and delivery completed by forceps or version; but if labor has not commenced and the cervix is long and not dilated, some radical measures must be adopted. The slower methods, which include bougies, packing with gauze, rubber bags, are contraindicated with an undilated cervix.

He feels convinced that if intervention is decided upon, it should be by a rapid method under anesthesia, *e. g.*, vaginal or abdominal section. The fetus, as well as the mother, is affected by the eclamptic poison; hence, the uterus should be emptied as soon as possible after the first convulsion. If a multipara, the vaginal operation is the choice; but if a primipara with a narrow vagina, the abdominal operation is, perhaps, the better. Any obstetric condition which makes delivery by the natural passages prolonged and difficult may be an indication for abdominal section. In short, the uterus should be emptied in the quickest time and with the least amount of trauma and shock to mother and child. There is more danger of sepsis when the abdomen is opened, and the mortality in abdominal section is distinctly higher, if vaginal examinations have been made. The danger increases with the number of examinations made and the lack of asepsis employed (Peterson).

Lumbar Puncture in Eclampsia. Since the first report of W. T. Wilson (Obstetrics volume, 1916, p. 50), he has seen 6 cases⁸ and operated on all. One died, but was moribund when seen and did not respond. From the small number of cases observed he is impressed with the return of consciousness in most cases in a short while, also there seems to be some increased action of the kidneys, probably due to the increased

intake of water. As consciousness returns we are able to give purgatives, also increase fluids. Puncture seems to be indicated in cases with severe and frequent convulsions; it does not, however, interfere with other forms of treatment for symptoms or the cause of the disease, we should continue treatment to get rid of toxemia, giving a proper diet, etc.

J. W. Snyder⁹ resorted to lumbar puncture successfully in a patient, aged 25, with her first child. About 2 drams were removed.

[Dr. Cornell, the Editor's associate, performed lumbar puncture in 2 cases—one recovered, one improved, and later was apparently cured by venesection.—Ed.]

Cesarean Section for Eclampsia in Twin Pregnancy. In view of the unsettled state that attends the treatment of eclampsia, coupled with a somewhat rarer feature of twin pregnancy and its successful issue for mother and both children, A. Schachner¹ deems the publication of this case justifiable.

FREQUENCY OF MULTIPLE PREGNANCIES IN ECLAMPSIA.

	No of Cases.	Twins.	Percent-age.	Percent-Triplets.	Percent-age.
Esch	496	19	3.8	.	..
Glockner	147	9	6.1	1	..
Goedecke	403	19	4.7	1	..
Goldberg	81	4	4.9	.	..
Olshausen	200	16	8.0	.	..
Peterson (vaginal cesarean)	530	17	3.2	.	..
Peterson (abdominal cesarean)	500	21	4.02	.	..
Schauta	342	27	7.8	.	..
Zweifel	83	5	6.0	1	..
	2782	137	4.9	3	.13

It was found in a former investigation that the maternal mortality was higher among the multipara. In the 3,134 collected cases it was 28.4 per cent., in multipara, while it was 22.35 per cent. among primipara. The age of the youngest patient was 12 and of the oldest 46, the average age of 448 patients was 26.6.

(9) Jour. Amer. Med. Ass'n., Sept. 29, 1917.
(1) Med. Record, Dec. 1, 1917.

The operative treatment has never been given a fair trial. To do this the uterus should be emptied soon as possible after the first convulsion, not after all kinds of medical treatment has failed.

Twins occurred twenty-one times in 500 cases of abdominal section for eclampsia or 4.02 per cent. Over three times as frequent as in normal cases.

The maternal mortality in eclampsia after abdominal section steadily increases with the age, it being 23.63 per cent. between 16 and 20 and 31.11 per cent. between 31 and 35.

Schachner's patient was a primipara, 19 years old. Eclampsia and premonitory signs of labor occurred simultaneously at full-term. There were 5 seizures the same day following operation, and 4 next day, none afterward. At time of report, a little over 4 months, mother and both children doing well.

Cesarean Section in Eclampsia. Details of a case are given by J. A. Foltz.² He observes that there are 5 generally recognized causes of the high infant mortality: (1) pre-maturity, (2) asphyxiation due to repeated convulsions with prolonged cyanosis, (3) toxemia, (4) drugs, administered to mother, (5) injuries sustained by forced delivery, application of forceps, etc. Nos. 2, 4 and 5 are eliminated by section without in any way increasing the infant mortality, without any new danger to the child and at the same time very markedly decreasing the danger to the mother. While, of course, the danger from toxemia is not eliminated by section, yet it is materially decreased.

J. B. DeLee, in the last edition of his work, makes the statement:

"When a pregnant, parturient, or puerperal woman has had the first convulsion, the case at once assumes a most serious aspect. The nervous balance has been upset, and one convolution is likely to lead to another. The mortality of eclampsia is still from 20 to 45 per cent. for the mother and 30 to 60 per cent. for the child."

Edgar, Williams, Dührssen, Olshausen and others give very similar statistics, therefore any procedure which in itself does not have an equally high mortality

and offers a reasonable opportunity of reducing its mortality should be employed.

Foltz's patient, aged 24, had an uneventful convalescence, with one notable exception. Both mother and baby well and happy.

The exception referred to was the following: On the 4th day she had a rather severe convulsion; Foltz happened to be at the hospital and ordered her given 1200 c.c. of Allen's soda solution. After she had taken about 800 c.c., intravenously, the respiration became slow and sighing, pulse rapid and weak and perspiration marked. In a few minutes, however, the color began to return and the patient complained of being very warm; temperature in axilla was 105.8°. Ice-caps placed on head and an alcohol bath given, when the temperature gradually began to go down. Blood negative to malaria.

Was this sudden rise of temperature due to or coincidental with the intravenous solution? If caused by the solution, what is the explanation? If not, how are we to account for the sudden rise and rapid and permanent decline of temperature? To make the blood suddenly alkaline will sometimes produce a severe reaction, but it would not seem that 800 c.c. should produce the reaction described.

Cesarean Section in Eclampsia. Since pregnancy is responsible for eclampsia, says W. E. Parke,³ its termination by one method or another is indicated as soon as a convulsion has occurred. The interest of both mother and child are served by the same procedure—early operation. Each case should be considered on its own merits, and that method of delivery adopted which best suits the case.

Delivery by the abdominal route is indicated in primiparæ where labor has not set in—or is not well advanced—where the child is living and viable, and the nearer the case is to term, the stronger the indications. Multiparæ at or near term—but not in labor—with rigid and high-placed cervixes may well be included in this group.

The contraindications to section are repeated vaginal examinations, examinations continued over a long pe-

riod—more particularly where the bag of waters has been broken; and, of course, where unsuccessful attempts at delivery have been made, and where there is any infective process in the birth canal.

Abdominal operations are attended with more risk than those through the birth canal if done under unfavorable conditions, hence a suitable environment and a capable operator and assistants are a *sine qua non*.

[The treatment of eclampsia is still undecided. Several accoucheurs of note have gone over to the side of the medicators, and report better results than they had before as operators. The Editor is still of the opinion that early, and often immediate delivery is the best for mother and babe,—but the environment must be excellent, and a man capable of his task to be had. In the hands of the general practitioner, the expectant and medical treatment will give the best results in the long run. The Editor agrees, in the main, with Hamilton's conclusions. If Cesarean section is selected, it would be well to remember that it may be done under novocain anesthesia (local), thus relieving the liver and kidneys of the poisoning by disintegrating drugs. The low, transperitoneal cervical Cesarean section is to be preferred to the classic.—ED.]

ABORTION.

Statistics of the Causes of Abortion. The admissions to the gynecologic service of the Washington University Dispensary in 4 1/2 months numbered 563. A history of abortion was elicited in 178, and 164 of the latter were studied in detail by G. D. Royston.⁴ He found only 13 showed perfectly normal genitalia. Some 108 patients exhibited 157 abnormal changes, the remaining 43 were obstetric conditions as pregnancy, incomplete abortion, puerperal state, etc., in which the real condition of the genitalia could not be definitely determined.

From his study of the case-reports the following conclusions are drawn:

Probably over 25 per cent. of all abortions are in

(4) Amer. Jour. of Obstet., October 1917.

duced; and 60 per cent. of all induced abortions result in more or less permanent sterility.

Abortions induced by the midwife, patient herself, and the physician, rank in danger in the order named. Neither married state, church affiliations, nor the fear of ill-health will deter a woman.

A positive Wassermann is obtainable in about 25 per cent. of all women who have aborted. Less than one-third of the syphilitic women give any history or show any physical signs of the disease, and only by a routine Wassermann can syphilis in the obstetric-gynecologic patient be detected. Syphilis interrupts pregnancy at any and all periods of gestation. Syphilitic women abort in over 60 per cent. of their pregnancies.

A renal deficiency interrupts pregnancy only in the event of a renal decompensation which produces symptoms, as a rise in blood-pressure, lassitude, headaches, insomnia or somnolence, vague discomfort, irritable uterus and a drop in the phthalein output. These indications are that an interruption is impending and are often amenable to treatment. Pregnancy may be interrupted as a result of renal deficiency at any period.

The phthalein test is of great value, though not an infallible index to the renal condition.

Extragenital factors can produce abortion and must be investigated if subsequent pregnancies are to result in living children. Finally, a poor state of nutrition influencing an interruption of pregnancy is usually but a symptom of a more important underlying condition as syphilis, impairment of the heart, lungs or kidneys.

[One of the accoucheur's most important duties is the study of the causes of abortion. Habitual abortion is one of the great disappointments of medicine. It is a not infrequent complaint, and the Editor frankly, and reluctantly, admits that he has made little headway in the treatment of his cases. If syphilis does not exist, little can be done. Infection of the uterus causes some cases, but it is not amenable to treatment. To determine the cause of the frequent interruption of pregnancy is seldom possible, and we are forced to empiricism—itself very unsatisfactory. Here is another promising field for investigation.—ED.]

Retained Secundines. A paper by J. E. Davis⁵ is based on the literature from 1878 to 1917 and of material from 474 routine gynecologic cases in which were found 70 pathologic sections of unresolved decidua, chorion, or other fetal tissues. Representing approximately 17 per cent. of cases in which pregnancy was almost wholly unsuspected.

Ten per cent. of all pregnancies end in abortion, according to popular estimates. According to many statistics 72 per cent. of abortions are incomplete and of these 45 per cent. become infected, whereas infection follows in 78 per cent. where criminal procedures are used. Criminal measures are the greatest direct and indirect causes of abortion, 55 to 65 per cent. Syphilis and endometritis are also prominent factors. A first abortion often leads to subsequent miscarriages and this explains 23.2 of all cases. The mortality is given as 3.9 per cent., or ten times as great as at full term.

Incomplete abortion results from difficult separation of the embryonal and maternal parts or from inadequate expulsive power. A portion which has undergone degeneration or necrobiosis may become separated alone and be expelled or retained by a rigid cervix. Or, as is usually the case in criminal abortion, especially after the first few weeks, the fetus may be expelled leaving the membranes adherent. Malpositions of the uterus may cause an early separation and incomplete expulsion.

The preplacental stage ends in the 3d week but the placental tissues are not well developed until the 6th week, the trophoblastic cells up to this time providing nutrition by imbibition from the maternal tissues.

In recent studies the ovum is considered capable of enzymic production in its trophodermic cells by which it digests the adjacent mucosa, thus forming a cavity for its implantation. The placenta is formed to control this dissolution and protect the mother. But up to the end of the 4th month the katabolism predominates.

The uterine stroma is a highly labile protoplasm very susceptible to nutritional influences. Due to its colloid content it avidly absorbs fluids, thereby effecting the changes incident to pregnancy, menstruation or chorio-

epithelioma. This process is most marked near the chorionic villi and predisposes to hemorrhage which is easily understood from a study of the nature of the blood-vessels of the mucosa. In the pregnant state these vessels have practically no walls but are really blood spaces through the stroma.

And here lies the crux of the entire question of abortion; and whether it is complete or incomplete depends upon the nature of the intercepting pathologic factors. Of these factors criminal measures comprise over 50 per cent. Syphilis, endometritis, metritis, malposition and inadequate placental sites, all may cause circulatory disturbances leading to partial separation, then hemorrhage, death of the fetus and incomplete abortion with retained secundines. The principles involved from whatever cause may ultimately have the same end-result of determining improper enzymic production and interaction with resulting abnormal metabolism, death of the fetus and incomplete expulsion.

Control of Criminal Abortion. In his paper on this subject R. M. Spivy⁶ refers to his previous statistical study of 250 abortions in the St. Louis City Hospital during 2 1/2 years. Of these 84 (33 per cent.) were confessedly criminal.

Titus in 274 abortions at J. Hopkins Hospital found 15 per cent. were criminally induced. Taussig in his study of 600 abortions in the Washington University Hospital reports 6 per cent. confessedly criminal.

In comparison with Spivy's findings these figures are low, but the patients seen in the Washington University and J. Hopkins Hospitals are of an entirely different type from those in the City Hospital. Secondly, his work was done 8 years later, proving to some extent that criminal abortions are surely on the increase.

The percentage of criminal abortions among the negroes is strikingly small; only 2 out of 33 colored women (6%), as compared with 82 out of 217 white women (38%). It is the married women, and especially the white married women with large families, who furnish the greatest problem in this sociologic question.

Of the 84, confessedly criminal, 62 were self-induced,

and in only 10 instances did the patient acknowledge the assistance of a physician or midwife. The remaining 52 had used some instrument, the most popular

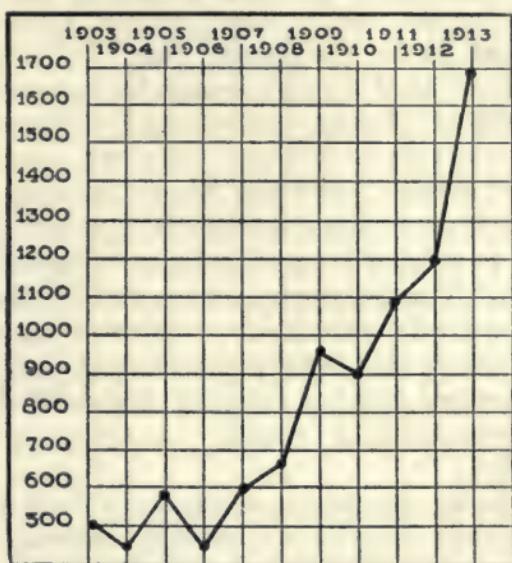


Fig. 6. Table showing increase of abortions in Berlin hospitals from 1904-13 (Spivy).

being the slippery elm stick and catheter. Of the 250 abortions only 43 were free from fever during their stay.

This unfortunate state of affairs will never be entirely stopped by merely making punishable by law the producing of abortions. In every country in the world it has been found to be a dismal failure. These women need special care and not punishment, something that cannot be said of the professional abortionist. Some help is surely to be brought about by bettering social conditions, the making easier of the lot of the illegitimately pregnant and birth and providing institutions for the raising of these unfortunate children.

The alarming increase of abortions is the natural result of a striving for the limitation of families; this no doubt being due to a great extent to the present economic situation, which makes large families an impossibility for the individual with a limited income.

Abortion Due to Superfecitation. A. L. Gustetter⁷

(7) Jour. Amer. Med. Ass'n., Jan. 5, 1918.

believes the following case shows that abortion or miscarriage may be due to superfetation. The patient, a II-para, aged 22, had a normal menstrual history. After the birth of the 2d child (April 10, 1917) menstruation began late in May, continued for 15 days, and was irregular. Late in July she began to menstruate again, and menstruated almost continuously thereafter. The blood was fresh and bright red, no clots. Sept. 16 there was a slight chill, and the blood now became dark brown, and began to have a slightly abnormal odor. On the 21st the patient delivered a fetus of about 4 months' development. The placenta was expelled also, showing it had been entirely detached. Gustetter introduced the speculum, and in the cervix discovered some white tissue, which proved to be a fetus of about 50 days' development, corresponding closely to when menstruation began in July.

The possibility of the second fetus being the cause of the continued menstruation and abortion is that it developed near the margin of the placenta of the older fetus; in its development it gradually detached more and more of the original placenta from the wall, causing the almost continued bleeding; and the profuse hemorrhages came on as the larger vessels were involved.

Treatment of Septic Abortion. W. E. Darnall⁸ has had 466 cases in his service. Some 237 manifested temperature ranging from 100 to 107.6° F. Thirty of these showed most severe infection with severe and repeated chills, high temperature, great prostration and delirium; these were of the virulent streptococcal type. Eight died in spite of all efforts. All of the 30 admitted that various things had been passed into the uterus and usually with no asepsis. When one considers that in 466 cases there were 8 deaths, the mortality is very low for abortion, taking all cases admitted. If the 8 deaths are figured against the 237 cases showing some degree of fever it is but 3.3 per cent., but if calculated on the 30 very severe cases, the only ones in which death occurred, then the mortality is nearly 25 per cent. The clean cases get well if aseptically handled. Those of mild infection by more or less nonvirulent bacteria

also show good results, but the streptococcic severe infections quickly overwhelm the patient.

What shall be our course of action in an abortion? Unless we can feel the uterus is empty curette them all, at once. In the end this is the safest. The mortality and the morbidity are much lessened. In a certain number the membranes, placenta and all, are passed intact, but one is never certain unless the product can be personally inspected. If the uterus is well contracted, the os tight, and bleeding ceasing, usually the uterus is empty. Nothing but harm then can be done by subjecting an empty septic uterus to any active instrumentation.

This happy state of affairs is rather the exception. Small pieces of placenta are nearly always adherent. If they do not cause infection they prevent involution and often bleeding until the patient may be actually exsanguinated. Darnall recently operated upon a case in which the Hb. had been reduced to less than 20 per cent. and reds 1,200,000, due to a small piece of placenta fastened to the posterior wall. When this was removed, the patient stopped bleeding and got well.

The usual routine in his clinic, if pregnancy is more than 3 months and the infection not virulent, is to do vaginal Cesarean section using the gloved finger to remove the products of conception. If 3 months or under, the cervix is rapidly dilated and the contents gently removed with small placenta forceps. This may be supplemented by gentle curettage with a broad base curette, which scrapes off the tissue.

There is no fear in using the sharp curette when most of the mass has been removed if used with skill. When one has developed that fine sense of touch to a degree that makes him fit to undertake a curettement at all, then the sharp curette will do less harm than the dull one in rough hands. Curetttement properly done calls for more tactile skill than any other operation in gynecology. The curette has been so much abused in unskilled hands that one wonders sometimes whether woman has profited more by its invention or suffered more by its abuse.

Sudden relaxation of the uterus sometimes takes place.

It balloons out and the curette suddenly seems lost with much the same feeling as if the uterus had been punctured. He has demonstrated there was no puncture, the relaxation taking place under the influence of the anesthetic. It occurs more often with chloroform than with ether, and might be termed "acute dilatation."

If the cervix is fully dilated, soft gauze wound about a pair of dressing forceps or the finger furnishes an admirable method of freeing the contents without doing harm. The uterus is then thoroughly swabbed out with equal parts of carbolic acid and iodine, the excess being taken up with alcohol. A small strip of iodoform gauze is then passed to the fundus and left in for 24 hours. Tight packing is only resorted to if hemorrhage is excessive and uterus very flabby; it gives it something to contract on.

With this method the temperature usually drops to normal by the following day, except in the very severe infections which have spread beyond the uterus itself. If these very severe cases can be seen quite early, some of them can be saved by a vigorous injection of anti-streptococcal serum in the very beginning, but not all.

One of the most important factors in producing the good results obtained has been the careful preparation. The vulva is invariably shaved, it and the vagina thoroughly scrubbed with green soap, washed with sterile water, followed by bichloride scrub, and finished with alcohol. This preparation should be as painstakingly carried out as if the abdomen were to be entered or extensive vulvo-vaginal operations done.

Treatment of Septic Abortion. The following is advocated and practiced by E. Ries.⁹ Expectant treatment until the abortion is completed spontaneously. Rectal examination exclusively and that as rarely as possible. Patient kept in bed on a light diet. If severe or protracted slight hemorrhage makes intervention unavoidable, the uterus is packed. The packing is removed after 12 to 24 hours and frequently the whole remnants of the abortion come away with the packing. If not, the packing has usually dilated the cervix so the uterus can be emptied manually. Repeated packing is not

favored as dangerous in itself. If the uterus is not empty after the removal of the packing, it is emptied preferably by hand, if necessary after additional dilatation with Hegar's dilators and if the hand is insufficient, with the sharp curette. The longer the interval between the last temperature and the operation the better. Packing afterward is avoided, unless necessitated by severe hemorrhage. The uterus is never irrigated. Ergot is given only when hemorrhage exists after complete evacuation of the uterus. Vaginal douches are never given until at least a week after the abortion and then only for subinvolution, not for purulent discharges. If the temperature is normal after the abortion, the patient is allowed out of bed at any time she feels ready, unless she is very anemic. She is fed well as soon as possible, and discharged 3 days after the last temperature, unless anemia, subinvolution, etc., require longer hospital treatment. Rectal examination is repeated before discharge.

In the discussion, J. B. De Lee said he was the first in Chicago (1897) to insist on the expectant treatment of puerperal sepsis. This he did, not as the result of any bacteriologic or pathologic study, but simply as a matter of clinical expedience. Owing to press of work at the Lying-In Hospital, it was impossible to carry out the established methods.

Since the early years of this century the practice at the Chicago Lying-In Hospital has been nonintervention in septic abortions. They pursue at the dispensary a more active treatment in the cleaning out of the uterus in simple abortion, but it is largely a matter of expediency. Sometimes the ignorant women allow themselves to bleed more than they should. It is inexpedient to wait for spontaneous abortions, and the practice has been, if the hemorrhage is at all considerable, to pack the vagina, and the next day come prepared to curette. After the cervix is dilated the uterus is curetted by finger or by instrument, and if the cervix is not dilated, pack again, and then the next day, almost invariably the conditions are such the uterus may be safely emptied.

Ries says where necessary in septic abortion to pack for hemorrhage, he does so, and the next day removes

the packing. He curettes either by finger or by instrument and dilates the cervix, if necessary. If at that time the hemorrhage has ceased, and removal of the packing makes one think it has definitely ceased, De Lee teaches not to pack, not to curette, but to wait another day or two and then pack again. Such cases are always taken to the hospital where the interne can pack in emergency if after 2 or 3 hours the packing being removed, the woman bleeds again.

De Lee still uses the pre-operative antiseptic douche when he has to go into a septic uterus, the object being not so much to kill off the germs there existing, but to remove as much as possible both mechanically by the douche and by reducing the vitality of the germs in the secretions and in the placenta, to reduce as much as possible the amount of infected material which is unavoidably ground into the uterine wall by the manipulations. The strength of the douche is not sufficient to kill the germs, and furthermore, within a few minutes they are far beyond the reach of any douche or curette. After the uterus is cleaned out he puts in occasionally a little iodoform packing because when that is removed little shreds of membrane and placenta which have escaped the curette are brought out, leaving the uterus clean and smooth. It stimulates the uterus to contract and helps to close up the lymphatics and possibly the blood-vessels.

In spite of the report of the Committee of the A. M. A. four years ago, in which it was conclusively shown that the expectant plan led to success, and copies of which were sent to every professor and assistant professor of obstetrics in the U. S., there still emanates from medical colleges the evil of active treatment. Parametritis, tube infections, pelvic abscesses, chronic pelvic peritonitis resulting in deformities of the uterus, too often follow manipulations.

Ries, in closing, said he dilated only those cases in which the packing has not produced sufficient dilatation. If the packing has not been carried to such an extent that the cervix admits one finger, a few Hegar dilators are used. De Lee spoke of douching for the removal of small particles. If the uterus is cleaned out, if the

placenta is cleaned out, the particles will come away by and by.

Results of Expectant Treatment. B. G. Hamilton¹ quotes the following from the Kansas City Hospital: In 125 cases, 75 showing temperature or hemorrhage, or both, were admitted and treated on the expectant plan but not curetted. The histories show the patients were in the hospital from four to six days with only 5 per cent. complications, as compared with 50 other cases in which curettetment was done as a routine, these patients being in the hospital on an average of twenty-two and one-half days, and 75 per cent. showing such complications as pelvic abscess, cellulitis, or general sepsis. These facts should be a warning against the routine use of the curette.

[The Editor has again allowed much prominence to be given the treatment of septic abortion. There still exists no agreement on the question of cleaning out a uterus containing infected ovarian débris. The expectant treatment has demonstrated its safety, and allows one to individualize his cases. Where the necessity for operative interference arises one will be able to justify the course by authority.—Ed.]

Pituitrin in Incomplete Abortion. For a year A. Lipkis² has treated incomplete abortion cases with small doses of pituitary extract without any curettetment or packing, with perfect success. He usually gives 1/2 c.c. hypodermically every day or every other day until the placenta is expelled. The longest it took in one case was 5 days; often it requires only 2 to 3 days. The amount of bleeding during the whole time is no more than for an ordinary menstrual period, usually less. The general condition of the woman after getting through with her confinement is a good deal better than that of a woman who is curetted.

The mortality in miscarriages is given by all authorities as greater than that of pregnancy at term. Taussig states the figures given in most textbooks are too low. He quotes authorities whose figures reach as high as 2 and 4 1/2 per cent., depending on whether it is sponta-

(1) Jour. Missouri State Med. Ass'n., November, 1917.
(2) Northwest Med., March, 1918.

neous or induced. The dangers from intervention, he states, "are four-fold: (1) danger of infection from the instruments and the hands of operator, (2) danger of severe hemorrhage, (3) danger of perforation of the uterine wall, (4) danger of cervical laceration.

By the use of pituitary extract the above dangers can be avoided and the mortality materially decreased.

Teratogenic Effect of Attempts at Abortion. Mme. Nageotte-Wilbouchewitch⁸ gives details of 5 cases of congenital malformations, and states she knows of others, which she believes were due to attempts at abortion. These failed, but the orderly course of development was interfered with. Such cases do not conflict with hereditary transmission of deformities. A child may be ill-developed for 2 reasons: Either the condition was hereditary; or, the parents were healthy and the pregnancy was disturbed by some intercurrent disease of the mother, poverty, etc. On the other hand, there may be hereditary malformation, or with no history of heredity, the child may have been subjected to some trauma during intra-uterine life.

Such effects are analogous to the ones seen by Féré, who produced monstrosities by experiments on hens' eggs, either by injecting poisons, *e. g.*, morphine, nitrate of lead, etc., or exposing them to the vapor of chloroform, and other agents. In Ascidian eggs, Chabry produced monsters made up of fractions only of the individuals, by destroying one or more cells of the segmenting ovum. It is evident, according to Chabry, that the monstrosity will be more complex, the earlier the lesion, the nearer it is to the time when destruction of one of the two blastomeres suppresses one-half of the individual.

[The Editor has had not a few cases where attempts at abortion had been made in the early months, either by medication or instrumentation, but no monster has developed. Yet he would readily concede the possibility —even probability of this action. Mall has shown that endometrial disease is a cause of monstrosities. Perhaps gonorrhea will acquire another aspect to an already bad reputation.—ED.]

EXTRA-UTERINE PREGNANCY.

Diagnosis of Ectopic Gestation. In a consideration of this subject L. J. Ladinski⁴ remarks that the signs and symptoms are more distinct than those associated with other diseases of the pelvic organs, and may be divided into two groups: (I) unruptured and (II) ruptured.

(I) *Unruptured Tubal Pregnancy.*

Amenorrhea, or some irregularity of menstruation, is generally present (excepting when tubal pregnancy occurs during lactation).

As a rule the patient feels she is pregnant, and may have the characteristic subjective signs. She may suspect the pregnancy differs from previous gestations.

Pain is a constant symptom, and is due to the small hemorrhages caused by the eroding villi or the distension of the tube by the growing ovum. It is sharp, lancinating and paroxysmal, and not only referred to the affected side, but particularly to the ovarian region.

Uterine hemorrhage, from decidual degeneration and separation, is a constant symptom also, usually begins about the 6th or 7th week, and invariably ceases after operation, or destruction of the ovum by rupture or abortion. In rare instances the disintegration of the decidua is retarded and there is comparatively little bleeding, and as a consequence the decidua is eventually expelled as a cast of the uterus. In his 280 operations, there were but 3 of these casts.

The uterus is invariably somewhat enlarged; its consistence, however, is that of the nonpregnant uterus. [?—ED.] In very exceptional cases, when a cast is expelled, there may be an elastic area in the anterior wall.

The presence of a distended tube on one side, which offers the feel of an elastic, tender, fusiform and usually movable tumor, is characteristic. The physical signs of a tube distended by a gravid sac, while not easily distinguished from hydro- or hematosalpinx, and a thin-walled cyst, can generally be readily differentiated from

pyosalpinx, retroverted pregnant uterus, pelvic abscess or exudate, and uterine tumors. [ED.]

Two negative signs of great importance are: the absence of temperature and the exclusion of uterine pregnancy. After rupture, there may be temperature due to infection of the extravasated blood by the colon bacillus. The leukocyte count and hemoglobin test are of no value. After rupture there may be an increased leukocyte count and reduced Hb. percentage.

(II) *Ruptured Tubal Pregnancy.*

The additional local and constitutional signs of internal hemorrhage attendant on rupture are pathognomonic. However, in slight ruptures hemorrhage may be scanty and cause no further symptoms than a sudden severe pain, followed by general abdominal pains, nausea and vomiting. Likewise, with rupture into the mesosalpinx, hemorrhage is usually not very profuse and produces very few signs. Successive ruptures may occur at indefinite intervals and escape attention, until the final rupture calls for immediate intervention.

The symptoms will depend on the extent of the rupture and the displacement of the ovum, and the amount of hemorrhage, and will range and merge from syncope to shock, collapse and occasionally unconsciousness. The anemia, blanching of the mucosæ, thirst, air hunger, shallow and rapid respiration, feeble pulse and subnormal temperature vary according to the degree of the hemorrhage and resisting power. Locally, the abdomen may be distended and tender, and palpation will elicit a fluid wave. [I have never succeeded in getting this.—ED.] Bimanual examination will, as a rule, reveal a soft, boggy tumor on one side or the other, which appears to be undefined in contour, and may change its shape under manipulation. When the gravid contents have become entirely detached, and float in the peritoneal cavity, or when perforation has taken place during the early weeks, especially in the isthmian type, no localized pelvic tumor will be palpable, and the only evidences of rupture will be the presence of free fluid in the pelvic and abdominal cavities.

Shock and collapse from ruptured tubal pregnancy may simulate lesions of other abdominal viscera; *e. g.*, perforation of the stomach, acute intestinal obstruction and biliary colic. There are intra-abdominal hemorrhages, however, which can not be differentiated from ruptured tubal pregnancy. In one case seen by Ladin-ski profuse hemorrhage was due to spontaneous amputation of a twisted ovarian cyst; in another, to torsion of the tube, with cyst of the fimbriated extremity. In a third case, perforation of a graafian follicle, and in several rupture of a corpus luteum cyst was followed by severe hemorrhage.

The pelvic findings in the unruptured varieties are characteristic and distinctive, while in the ruptured cases the signs of hemorrhage will often prove the determining diagnostic factor.

Exploratory vaginal section for diagnostic purposes is absolutely uncalled for in tubal pregnancy, and is an unsatisfactory procedure.

Differential Diagnosis of Ectopic Pregnancy. Some of the common conditions which lead to confusion are enumerated by F. W. Langstroth, Jr.⁵

(1) Chronic appendicitis especially when accompanied by a cystic or infected right-sided ovary that is increasing in size. Such ovarian conditions are often accompanied by irregular menstruation which greatly resembles the intermittent bleeding of ectopic pregnancy. Also the primary rupture of an ectopic pregnancy is often not accompanied by more pain or shock than might occur at times from a chronic appendix.

(2) Small intramural or intrauterine fibroids especially when associated, as they often are, with one of the various ovarian masses, may give rise to a chain of symptoms that during the first 3 months of an extrauterine pregnancy are extremely hard to differentiate.

(3) Acute and chronic pus tubes and ovaries are often accompanied by a uterine flow as to give an almost typical picture of early extrauterine pregnancy.

(4) Ureteral calculi may be associated with ovarian and menstrual abnormalities that would lead to a possible diagnosis of ectopic pregnancy.

(5) Jour. Med. Soc. New Jersey, September, 1917.

Temperature may be present or absent in any of the above mentioned conditions according to their degree, to the amount of walling off of the pus and to the susceptibility of the individual to febrile reaction. In ectopic pregnancy also we may or may not have temperature depending largely on the amount of extravasated blood to be absorbed.

There are other pathologic changes which can readily be confused, under certain conditions, with an extrauterine pregnancy; especially if they occur during the first 3 months:

(5) Abscess of other structures pointing into the pelvis.

(6) Pelvic displacement of the kidney.

(7) Malignant or other growths of the appendages.

Any of these conditions may be complicated with an extrauterine pregnancy of the unaffected side.

Diagnosis of Unruptured Ectopic Pregnancy Based on Tubal Pathology. This subject is dwelt on by J. O. Polak.⁶ He remarks we have the following points brought out in the history of unruptured cases. First, as a rule, *ectopic pregnancy occurs* most frequently *where there is anomaly or inflammation of the tube*, in the woman *who has had premenstrual dysmenorrhea*. Second, like other pregnancies, there is *either a period of amenorrhea* or an attempt at menstrual suppression, but because of the *unstable position of the ovum*, owing to the imperfectly developed tubal decidua, the *erosion of the syncitial cells into the muscular structures of the tube* produce such ovarian unrest as to cause peristalsis. This is evidenced by *colicky pains* and *uterine bleeding*. The stretching of the tube by the *growing ovum or by the overdistension* produced by the effusion of blood into the muscle structures and the decidua, *causes a soreness over the region of the stretched gestation sac*.

When we come to the physical signs, their relation to the pathology is still more striking and easily explained. First, *the uterus is enlarged* because it *contains a decidua* prepared in anticipation of reception of the ovum. *The cervix is soft*, due to the congestion consequent upon pregnancy, yet the uterus *does not have*

the characteristic diagnostic sign of pregnancy, *elasticity of the median portion of its anterior wall and compressibility of its isthmus*. This is because of the absence of the growing ovum. While it is enlarged it is not, however, changed in shape or consistency, *except for the slight softening of the cervix*. [This does not agree with my experience.—ED.] It is, however *sensitive to motion*. This is particularly true on attempted motion of the cervix, for by the gravitation of the blood from the end of the tube or through the tubal wall because of its porosity, and the prolapse of the tubal mass, the peritoneum in the cul-de-sac covering the utero-sacral ligaments, is irritated and becomes sensitive. The pulsation of the uterine artery is more apparent on the side where we find the gestation sac.

This is particularly noticeable after intraligamentation, because the blood vessel supply on that side is increased, consequently, the calibre of the vessel is enlarged and besides that the tendency of every enlarged tube is to drop down into either the posterior or posterior lateral cul-de-sac which naturally depresses the artery and brings it more within reach. *The uterus is displaced* because the tubal tumor has fallen by its weight into the lateral or posterior, or anterior cul-de-sac. The *tumor displacing the uterus* has certain definite characteristics which are again in line with the pathology. *It is rapidly growing*. This increase is not alone due to the growth of the ovum but also to the extravasation of blood into the muscle and decidua in the tube. It is *exquisitely sensitive* because the tubal covering is stretched to its utmost. [Not always.—ED.] It is *fluctuant* because the contents of the ovum and the contained blood are fluid. Hence we see that all of the physical signs have an intimate relation to the actual pathology in ovarian arrest within the tube.

When rupture or tubal abortion occurs we have sudden pain, due to the *erosion through the tubal wall* and *escape of the ovum*, or to the *peristaltic expulsions of the ovum from the ampulla*. The *peritoneum* immediately REACTS and we have the signs of an abdominal calamity—shock of greater or less degree. If the hemorrhage is inconsiderable, the patient will react, while if

it is considerable the patient goes into collapse. With this there is an increase in the pulse, a drop in blood pressure and a leukocytosis. *Rupture or abortion, usually means death of the ovum, consequently, there is no further use for the decidua which has been prepared inside of the uterus, and this is expelled piecemeal or in mass as a cast, with uterine hemorrhage.* Primary rupture or abortion generally occurs before the 8th week and is seldom attended with tragic symptoms. There is usually an intervening period of several days, sometimes a week or more, before a further rupture takes place. This is absolutely the fact in over 80 per cent. of tubal pregnancies, so that is little excuse for not heeding the danger signs and waiting for the tragic stage. Anyone, even of mediocre intelligence, can diagnosticate intraperitoneal rupture with its abdominal pain, collapse, pallor and signs of hemorrhage.

Treatment of Ectopic Gestation. In 1908, J. H. White⁷ read a paper advocating delayed operation, and in a later one states his subsequent experience has only confirmed his views. The majority of ectopic cases end in abortion; when complete the hemorrhage is apt to be severe, due to the deficiency of muscle fiber at placental site. On the other hand partial abortion with little tearing of tube may produce only slight hemorrhage and shock to be followed later by severe hemorrhage and profound shock. In one case, the tubal abortion was complete and considerable bleeding had taken place, but at operation, some 5 days later, there was no fresh blood.

The time elapsing between rupture and operation was from three days to three months. Fifty per cent. were in nullipara. One case had three operations in four years. The first operation was performed by a surgeon who opened the cul-de-sac, drained and left the tube in situ. Two years later White operated for ruptured ectopic and found opposite tube involved. A scar on the left tube he took for the site of rupture of previous tubal pregnancy. The year following the second operation he operated again for tubal gestation in the tube on which scar was found.

Mortality would be materially lessened if these pa-

tients, after rupture and while in shock, were left where found, ice bag placed on abdomen, morphine to relieve pain and produce rest, strychnia for general stimulation and kept absolutely quiet, their chances of recovery following an operation when they rally will be much greater than if rushed off to a hospital.

Operation for Ectopic Pregnancy. E. A. Constable⁸ narrates a case in a patient, aged 31. First child (7 months) born Nov. 4, 1915. Six weeks later had her first period, which lasted a week. A very scanty loss every few days up to February, 1916, when a "piece of shaggy flesh" was passed (no blood). Then *total cessation* until August, after which periods became reg-

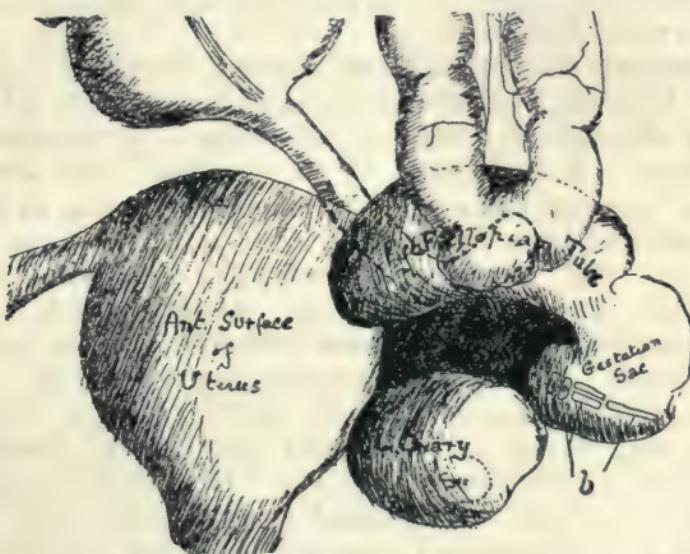


Fig. 7. Specimen from ectopic pregnancy; *b*, fetal bones (Constable).

ular and normal in amount. Patient had had pain since her confinement, but in February had "labor-like pains," and considered herself pregnant. In hospital from March to July. Here she was curetted "for a miscarriage." The pains continued, and patient felt weak.

On admission Oct. 10 a large swelling in right side of pelvis and pouch of Douglas. Uterus slightly larger

(8) Lancet, Oct. 20, 1917.

than normal and pushed over to left. Nov. 8 swelling on right smaller but still tender. A swelling, not previously observed, in corresponding region to left. Nov. 16, pain in lower abdomen, especially right, much worse. Tenderness on superficial palpation; relieved on deep palpation. No rigidity. Nov. 24, operation.

Omentum, appendix, and a loop of ileum adherent to fundus on left side. On freeing these, a hard mass was found at left tubo-uterine junction. This turned out to be the greatly dilated tube and ovary, on the surface of which were some fetal bones, a femur, tibia, and fibula, also metatarsals of both feet. Close to the former and parallel were some nodules thought to be the spine, with cranium at lower pole. Parts removed were both tubes, left ovary, gestation sac, and appendix. Uninterrupted recovery.

Secondary Abdominal Pregnancy. Details are given by B. Quarella⁹ of an extraordinary instance of secondary abdominal gestation following a perforation of the uterus. A multipara, of 45, confessed that after 2 months' amenorrhea an attempt had been made at abortion, and had been followed by uterine hemorrhage, violent pain, and vomiting. Gradually these passed off, but menstruation did not return. About the 5th month of amenorrhea she had a severe abdominal crisis, lasting for a week, and similar attacks had occurred. The breasts and abdomen showed the ordinary signs of pregnancy, and palpation revealed a swelling of irregular consistence in the lower abdomen. On bimanual examination the uterus was pressed against pubic arch and difficult of delimitation; a projecting mass in posterior fornix. No fetal heart or uterine souffle heard. Provisional diagnosis of extra-uterine pregnancy, and the abdomen was opened. The uterus, size of adult fist, was lying to front and slightly to left; the pouch of Douglas and right half of pelvis occupied by the placenta; a fetus was lying free (without membranes) among the intestinal coils; cord cut and fetus, which lived for three hours and had a uterine age of about

(9) Ann. di Ostet. e Ginec. (quoted by Edinburgh Med. Jour., October, 1917).

PLATE XI.

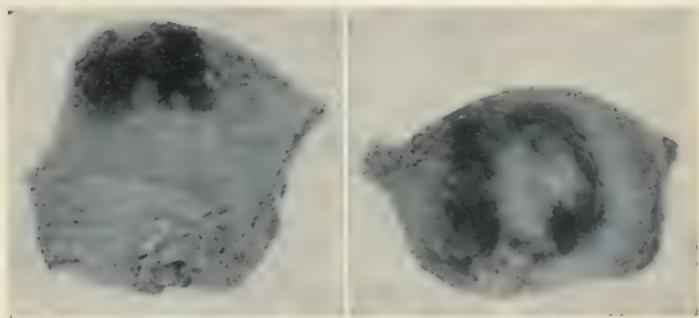


Showing the position of the child, the "after-birth" and uterus after the omentum and intestines were dissected free and the child and placentae delivered.—Fischer (see p. 225).



Operation for abdominal pregnancy. Showing the uterus reflected on the tumor mass, with the large veins of the "after-birth" well shown, with adhesions of the omentum and intestines down over the child with its left foot free in the abdomen.

PLATE XII.



Left: Fundus of uterus containing interstitial pregnancy viewed from behind. Specimen consists of right half of fundus with uterine end of right tube. This portion of the uterus was elevated nearly an inch above remainder of fundus from which it was excised.

Right: Interstitial pregnancy viewed from above. The fluctuating thin-walled, hemorrhagic uterus over the sac shows that rupture was imminent.—Curtis (see p. 227).

6 1/2 months, quickly extracted. The placenta was easily separated from the rectum, pouch of Douglas, and pelvic cavity; but so firmly fixed to posterior surface of uterus that attempts at removal were followed by hemorrhage and the discovery of a perforation of the uterus. Subtotal hysterectomy was quickly performed; but the patient, who had been taking the anesthetic badly, fainted, and, despite all efforts, died in about half an hour. There was a perforation in the posterior wall 3 ctm. long and occupied in part by placenta. Obviously the attempt at abortion, carried out with a rigid instrument, had perforated the organ and allowed the fetus to escape; the placenta had passed through also, except a small portion which maintained a vascular connection between the fetus and the uterus.

Operation for Abdominal Pregnancy. L. C. Fischer¹ who narrates the case, states the patient was a negress, aged 22; three children, no miscarriages. In March, 1916, she missed her period and supposed she was pregnant. Two months later taken suddenly with sharp pains in lower right quadrant, followed by severe shock. A doctor advised that her condition was possibly due to a "biliary" attack or "indigestion." In bed for 2 months at this time, with occasional recurrence of the intense pains and prostration. She had all the symptoms of pregnancy. Quickeening at 4 1/2 months, which movements were continuous till November, at which time she was seen by her physician. Pains, simulating labor pains, persisted for 12 hours without any dilatation. There was a recurrence of all of the symptoms of normal labor every 30 or 28 days from her first attack until admission March 26, 1917, operation in 48 hours. Upon opening the peritoneum the first presenting part was the left foot, surrounded by intestines and omentum. The head was packed tightly into the pelvis, moulded to the pelvic bones. Child partly covered over by the right tube and intestines, the tube being dilated almost to the size of the child on one side. Placenta attached to distal end of tube and then on abdomen of child. Supravaginal hysterectomy, removal of left tube and ovary. Recovery (Plate XI).

(1) Southern Med. Jour., November, 1917.

Ruptured Ectopic Pregnancy, Transfusion, Pulmonary Embolism. R. V. B. Shier² operated on a patient in her home, just 6 hours after onset. She was pulseless, pupils dilated and altogether not at all encouraging. The ruptured tube was easily located, its pedicle clamped and tied off. Pituitrin 1 c.c. given. Abdomen made reasonably free of blood and clots, and incision closed. In about 2 hours 750 c.c. of blood transfused from husband by citrate of sodium method. The incision healed by first intention and by the 8th day she had a normal temperature, and a pulse of 96.

Her improvement continued until the morning of 12th day, when suddenly she was seized with a fainting spell and gasped for air. Collapse followed immediately, the pulse dropped to 70 and very weak. Shier found her cyanotic and dyspneic. The respiratory rate reached 58 to 60 at times. By this time one could notice marked diminished expansion of left lung. Condition much the same until death in 36 hours.

Full-Term Ectopic Pregnancy With Operation 8 Months Later. E. Mathis³ records a case in a negress, aged 25, married at 20; first child 10 months later, second 2 1/2 years after first. When this baby was 9 months old, she began to have excessive bleeding, lasting two weeks at a time. This occurred each month up to the 6th. She experienced morning sickness early and began to notice enlargement of her breasts and abdomen. She felt some movement from the 6th month on, but the bleeding was less. One morning, the last of April, the pain was so severe she could get no relief and the movement of the child was very vigorous. All at once she felt something "stretch out" with such force it took her breath away. After a few minutes, the "thing inside" became perfectly motionless and she was soon up and about. From then on in fairly good health, except for a big abdominal mass, and for the next 7 months did all her own housework. Monthly sickness was regular each month with the usual amount for these 7 months. Early in December she again prepared for delivery. Nothing coming of this, and fever and chills being added

(2) Canada Med. Ass'n. Jour., May, 1918.

(3) Texas State Jour. of Med., May, 1918.

to her monthly sickness, she permitted exploratory operation.

Operation. Dec. 19, 1916, a large mass was found filling the abdomen. It proved to be an ectopic pregnancy of the right tube, about the size of a small water-melon, with a thick capsule adherent to most everything in the abdomen. After freeing adhesions the uterus could be seen, of normal size and pushed down in cul-de-sac. The sac broke in taking it out and about a pint of a thick fluid of very foul odor was found in the amniotic cavity. No remains of the placenta could be distinguished. The child apparently dead several months, was fairly well preserved, and about full term. Examination at the time of discharge showed patient in good physical condition.

Interstitial Pregnancy. Waegeli's researches on this topic were referred to in the Obstetrics volume for 1916 (p. 65). He collected 150 cases, only 53 authentic. A. H. Curtis,⁴ reporting another, states the condition is characterized by 3 features—the fundus is more vertical, the round ligament is inserted lateral to the sac, and the tubes are asymmetrically inserted on the fundus. Rupture tends to occur later than in other pregnancies. An authentic case of rupture into the uterine cavity has not been reported.

Curtis' patient, aged 27, had one child, 2 years old, and later a fetus was expelled spontaneously at 9 weeks. She sought advice on account of incontinence of urine. Examination disclosed cystocele and a softness in right uterine horn. From the menstrual history, pregnancy was suspected, and operation for the incontinence deferred. Two weeks later, the mass was larger, boggy, and immediate operation revealed the interstitial pregnancy, almost on the point of rupture (Plate XII).

Two Cases from the Johns Hopkins Hospital are recorded by H. M. N. Wynne.⁵ In 1547 examples of ectopic pregnancy from various clinics, only 18 (1.16%) were interstitial. The prognosis is very grave, mortality about 11 per cent.

(4) Surg., Gynecol. and Obstet., May, 1918.

(5) Bull. Johns Hopkins Hosp., January, 1918.

Analysis of 92 Cases of Double Recurrent and Bilateral Tubal Pregnancy. In addition to 3 unpublished personal cases, A. P. Heineck⁶ has studied 89 reported from 1908-16. Double tubal pregnancies are almost invariably bilateral. Double and bilateral tubal pregnancies are either simultaneous or recurrent. If simultaneous, both conceptions begin at or about the same time; both gestations may develop, or one may be interrupted and the other continue. Usually, the two cysts differ in size and destiny. Twenty-nine of the double tubal pregnancies considered belong to the simultaneous group. One double tubal gestation occurred in a nullipara of 41, another in a multipara of 45. The other simultaneous cases in which the age was recorded follow:

From 20 to 24, inclusive.....	3 cases, 10.34%
From 25 to 29, inclusive.....	11 cases, 37.93%
From 30 to 34, inclusive.....	7 cases, 24.13%
From 35 to 39, inclusive.....	7 cases, 13.79%

The recurrent type is by far the most frequent (63 cases). Almost always, the recurrence is in the opposite tube.

The ages at the time of the 2d tubal gestation is shown by the table:

From 20 to 24 years, inclusive.....	3 cases, 4.76%
From 25 to 29 years, inclusive.....	20 cases, 31.74%
From 30 to 34 years, inclusive.....	20 cases, 31.74%
From 35 to 39 years, inclusive.....	7 cases, 11.11%

Comparison of the previous tables with the following reveals that the age incidence of tubal gestation is not the same as that of uterine.

Normal births in Chicago 3,600 cases (Redfield).

From 20 to 24 years.....	31.95%
From 25 to 29 years.....	29.72%
From 30 to 34 years.....	18.64%
From 35 to 39 years.....	10.14%

Double and bilateral tubal pregnancies can occur at any period of the child-bearing age. The frequency of recurrence in the practice of 8 clinicians was 39 times in 700 instances of tubal gestation.

Normal pregnancies may be sandwiched in between two extra-uterine gestations.

Months, or even years, may elapse between the incidence of pregnancy in one tube and the lodgment of an impregnated ovum in the opposite tube. In the collected cases, the interval varied from three months to nine years; in 21 cases, tubal gestation recurred within one year; in 12, within three years.

Double, recurrent and bilateral tubal pregnancies occurred in women who have never borne living children. Tubal pregnancy has recurred in women who have borne 1, 2, 3 or more living children. Double, recurrent and bilateral tubal pregnancies like other ectopic gestations not infrequently occur in women who though frequently exposed to pregnancy have remained sterile. In many cases, a long period of sterility precedes double, or intervenes between two tubal gestations.

These 92 cases represent 185 tubal gestations. Not one of these pregnancies, either first or second, went to full term. Sixteen gestations were subjected to operative relief previous to tubal abortion or rupture; 32 tubal gestations terminated in abortion; 75 in rupture. In the rest, the termination is either not recorded or not definitely stated.

Even a pin-point rupture may cause a fatal hemorrhage. In the only case of this series in which hemorrhage apparently caused death, the rupture was a small orifice on the free portion of tube.

The mortality of bilateral tubal pregnancy, skilfully operated on, is very low. It should be *nil*. In the collected cases, there were only 3 deaths; 2 from peritonitis and ileus, and 1 from peritoneal hemorrhage.

Double Simultaneous Extra-uterine Pregnancy. The patient operated on by G. de Rosas⁸ was a multipara, of 34; previous pregnancies normal, not pregnant for 5 years, menses irregular during this interval. In September she missed a period, and had pain in lower abdomen, with nausea. The attendant made a diagnosis of ruptured tubal pregnancy or pelvic hematocele. The author, called in consultation, verified the diagnosis,

(8) Revista Med. Cubana (quoted in Med. Record, 1918, p. 777).

and patient was laparotomized. The abdomen contained much blood, from a rupture in left tube, which contained the remains of a tubal abortion. The right tube was found the seat of a swelling, with thin wall, and adherent to ovary. It was found to contain blood and circumscribed villi. The embryos were not over 2 weeks old, and appeared to be of the same age. Both adnexæ were extirpated, drainage being through the wound.

[Owing to the paucity of new material,—the result of the War, the Editor has permitted the extraction of many articles, even though there is very little of novelty in them. The reason is that it will do us much good to review, and ruminate over what has been done up to the present; and we will be able to assimilate the good and eliminate the waste.

One point in the foregoing reviews deserves comment —operating in shock. The War has shown us that there are several kinds of shock, nervous, anemic, toxic and septic (Gatellier). This division appeals to the Editor as very useful, altho' it was applied to war wounds. Gatellier recommends immediate operations in shock from hemorrhage,—and in this we agree.—ED.]

PART II.

LABOR.

TREATMENT.

Indications for Pituitrin. B. G. Hamilton⁹ knows of nothing in obstetrics that is being less intelligently used than pituitary extract. The literature is full of accidents both to mother and babe. The generally accepted indications are:

1. Multipara, with cervix fully dilated, head engaged and rotated anterior, with inertia or lagging pains.
2. In gaseous distention of the bowels, the upper intestine and stomach being empty, especially following Cesarean section, pituitary extract produces marked results. [Not after C. s.—Ed.!]
3. In retention of urine, the use of the catheter is lessened.
4. In atonic condition of the uterus with hemorrhage, where the placenta has not been expelled, it does not produce an hourglass contraction as does ergot.
5. Following Cesarean section for hasty contraction, where it should be followed by ergot.
6. It has no place in normal labor, in any case where there is an abnormality in presentation, nor where there is pelvic dystocia.

[Pituitrin is gradually being relegated to its proper place in obstetrics,—but too slowly, since the reports of bad results continue to come in. It is a two-edged knife, and must be used with extreme care.—Ed.]

Care of Perineum During Second and Third Stages. It is now generally recognized that little can be done directly to save the perineum. [At last!—Ed.] D. B. Hart, in a discussion at the Edinburgh Obstetrical So-

society, explaining his technique in which he places his thumb on the perineum, a towel between, and extends the fingers over the advancing head to the nape of the neck, said he could not be classed with those who do not support the perineum. Though Hart's position of the hand may be used for controlling the forces in delivery, yet J. P. Gardiner² believes no feeling of security should be placed in it as protecting the perineum directly from injury. In his position of the thumb, if much external pressure is used by the thumb, is it not grinding the perineum, which is already at the bursting point, between the thumb and oncoming head? The idea of protecting the perineum directly may, with the above citation, be dismissed. However, a very great deal can be done indirectly, by directing the forces concerned in the expulsion of the child and in the correction of the malpositions.

The consensus of opinion may be summed up in the following statements: 1. Avoid a too rapid delivery by allowing the fascia and muscles time to stretch. 2. Allow head to pass through only in its smallest diameters. 3. Allow favorable delivery of shoulders.

Management of Normal Labor in Country Practice. S. J. Allbright³ points out that because of the inaccessibility of many patients, and the doctor does not know the nature of the case, many times he reaches the patients without any means of helping them other than his knowledge of the mechanism of labor, and his two hands. But even this predicament does not justify the neglect of aseptic precaution. One can always have fire and water and some kind of soap, which combination, if used vigorously, is fairly safe. The preparation of the patient the way it would be done in a hospital can not be carried out to an advantage. [Nor, with appropriate technic is it necessary.—ED.] Women are so accustomed to getting along without having the vulva shaved, bathed and packed in mercuric chloride that they resent it. Also, the pre-labor enemas only cause irritation of the lower bowel so defecation takes place

(2) Ohio State Med. Jour., February, 1918.

(3) Jour. Arkansas Med. Soc., April, 1918.

during labor, which is not only embarrassing but a new source of danger of sepsis. Hot bichloride cloths on the vulva during the 2d stage conduces to relaxation and tends to prevent a tear; but if used repeatedly, they become a likely source of infection from contact with the anus and discharges therefrom.

Allbright is thoroughly convinced we make too many vaginal examinations. Obstetricians in hospitals are now advocating no vaginal examinations; but this is such a radical change for those in the country, that it will be some time before they get to it. [Let them try rectal examinations.—ED.] However, let us make few examinations, none after rupture of the amniotic sac, unless absolutely necessary.

A large per cent. of injuries to the woman and child during labor are caused by the physician trying to hurry the process. *E. g.* forcible dilatation of the os, manipulation or massage of the inner border of the os, premature rupture of the membranes, and giving pituitary extract before the os is fully dilated or dilatable.

If artificial rupture of the membranes is necessary it should be carefully performed with a sterile instrument. He knows of a physician, who, it is said, carries a horse-shoe nail in his pocket and uses it on case after case without even washing it. Well, the nail would not be such a bad instrument even if crude, the end being protected while being introduced; but he should at least boil his nail before he uses it!

[Do such practitioners really exist at the present time?—ED.]

Another neglected feature by the country physician is the inspection of the perineum and its repair if lacerated. While most women appreciate our work more if they are not exposed (*i. e.*, the work is done under cover), there are very few but will think more of us if we look to see if they have a laceration. And, if a laceration is unrepaired, that woman will always feel like we did not do our duty.

[Allbright is, in 1918, striving against conditions we knew existed in 1888.—ED.]

ANESTHESIA.

Analgesics in the First Stage. R. W. Stearns⁵ enumerates the analgesics and sedatives used in the first stage as: Morphine, either alone or in combination with cactin and hyscine or scopolamine; codeine, belladonna, either applied locally as cerate or given as atropine; ether, nitrous oxide, chloral, bromide, hot douches, cocaine injected locally and pantopon. Local measures as the hot douche and belladonna cerate rubbed into the lining of cervix are objectionable because of the possibility of introducing infection, as the cerate must be well rubbed in to have effect, and some water from a douche might enter the womb.

Chloral is very good when an hypnotic effect is desired and often works well in combination with other drugs. De Lee speaks of its irritative action on the kidneys and its depressing action resembling chloroform. He believes it should be used very sparingly. When given per rectum in full doses it is likely to be expelled or cause more or less distress.

Morphine commends itself as the safest sure remedy for the pain of 1st stage. Aside from ether it gives the most complete relief from the agonizing pain which, with the loss of food and sleep, so often unfits a woman for the strenuous 2d stage. It conserves all her powers for the final expulsive effort, when without it so many find themselves exhausted in body and spirit. The action hypodermically is quick and definite. Within one-half to one hour it has reached its maximum effect and, if there is no disturbance of the fetal heart tones and the mother is in good condition, it can be repeated. Very seldom are more than two doses required. If the patient is too badly excited a few whiffs of ether will get her under the influence and the morphine will then keep her from feeling the worst of the pain. There are no bad effects.

De Lee, one of the most conservative writers on the subject, gives no contraindications to its use early in the first stage. It is not, however, a measure for universal use any more than is the forceps operation at

present. There are six definite *indications* for its use, and given any one of these, in the absence of any contraindication, the limited use of morphine will be a great aid to the obstetrician:

(1) The early "pinching" or "back pains" which are so wearing if long continued. This indication will often be found in the young nervous primipara.

(2) Tetanic contraction of the uterus affecting the lower segment particularly. This is not so often found but there is great need for some relief.

(3) Threatened shock from pain and exhaustion. Often in primiparæ, when there is a relative disproportion between fetus and pelvis, when the long continued agonizing pains threaten to wear the woman out before the first stage is completed. Stearns has had six such cases, three terminating normally and three requiring forceps. None of the latter necessary because of weakened pains.

(4) Inertia uteri, due to reflex influence in nervous, highly sensitive patients.

(5) These patients have fulminating pains, coming so fast and furiously that they threaten completely to destroy the integrity of the cervix and later the perineum. There are some women to whom severe pain has very little retarding effect. It seems almost impossible for them to relax when told to.

(6) This is similar to the No. 4 but more inclusive, namely, in pains of any sort in a patient not used to bearing pain and not able to stand it well. This is more common in young primiparæ among the highly educated and those of artistic temperament.

These indications have included about 35% of his cases and in none has there been any bad effects.

The *contraindications* are (1) patients displaying any idiosyncrasy. This should be inquired into in taking the history. (2) Former victims of the morphine habit. (3) Patients who, from principle or other reasons, do not want to take morphine. This will seldom obtain. (4) A certain type who do not suffer greatly in delivery and believe it is better to allow perverted Nature to take its course. (5) When pains are irregular and feeble in a debilitated woman not oversensitive to pain.

(6) In women with very thick abdominal wall, with placenta located anteriorly or in whom for any reason the fetal heart tones cannot be heard. Not more than 1/4 grain should be given.

Experience with 300 Injections of Scopolamine-Morphine. These are contributed by E. B. Heffernan,⁶ who began their use in a country practice, and the results were so pleasing, he has continued them in the city of Melbourne. About 3 per cent. of patients were quite unaffected, some 10 per cent. had only partial amnesia, while total amnesia was produced in the others.

Proper working conditions are absolutely essential to success. First, all his patients are treated in a private hospital in charge of a thoroughly competent nurse, who has had 5 years' experience. Next, he uses only a combination of morphine hydrobromide, gr. 1/6, and scopolamine hydrobromide, gr. 1/150, for the first injection, followed by scopolamine, gr. 1/100, alone for further injections. The use of hyoscine instead of scopolamine has led many to condemn this method.

The advantages of morphine and scopolamine from the patient's standpoint are: (1) Relief of apprehensive feeling. (2) Relief of pain. (3) Loss of memory of hours and hours of misery. (4) Removal of that dread of labor which makes pregnancy even a greater burden. From the obstetrician's viewpoint, its chief recommendation is the complete absence of shock and exhaustion, even after a long and difficult labor.

Against this it has been stated that labor is prolonged, the tendency to hemorrhage increased, and the risks to the child greater. Heffernan has found that the 1st stage is usually accelerated, probably by the relief of spasm. The pains also are affected, being lessened in frequency, but increased in force. During the 2d stage there is occasionally a tendency to inertia, but this is readily overcome by pituitary extract. He has used these drugs in all cases, normal and abnormal, and so far met with no contraindications, except an incompetent nurse. This is the main objection to its use in private houses, as most nurses have ideas of their own

on midwifery, and cannot modify them to suit different obstetricians.

Scopolamine-Morphine Narcosis in Childbirth. At a meeting of the Section of Obstetrics and Gynecology (Royal Society of Medicine)⁷ the Committee formed to investigate this narcosis reported: The observations were carried out independently. A standard solution of scopolamine was employed, the initial dose being morphia gr. 1/4, scopolamine gr. 1/150. Subsequent doses consisted of scopolamine gr. 1/450. The patient was isolated during labor, and, as far as possible, precautions were taken to avoid sensory impulses. The cases were preferably primiparæ in whom no complications were anticipated.

St. Bartholomew's Hospital, H. Williamson (20 cases).

Analgesia was marked in 12 of the patients, slight in 5, and absent in 3. No definite relation could be traced between analgesia and amnesia.

Complete amnesia was attained in 11 cases = 55 per cent. Incomplete amnesia was attained in 4 cases = 20 per cent. Incomplete amnesia was absent in 5 cases = 25 per cent.

In these the whole course of labor was remembered.

St. Thomas' Hospital, J. S. Fairbairn (80 cases).

Complete amnesia was obtained in 36 cases = 45 per cent. Partial amnesia was obtained in 26 cases = 32 per cent. Amnesia was absent in 18 cases = 22.5 per cent.

Analgesia was considered as complete when complete amnesia was obtained, partial when the patient appeared to obtain relief from the injections and was satisfied that she had had an easy labor, and absent where she did not seem to have had any relief.

Complete analgesia was obtained in 36 cases = 45 per cent. Partial analgesia was obtained in 40 cases = 50 per cent. No analgesia was obtained in 4 cases = 5 per cent.

(In 20 cases also reported by Fairbairn, from the General Lying-in Hospital, the general results were the same as at St. Thomas'.)

Queen Charlotte's Hospital, Roberts and Stevens (67 cases).

Amnesia.—The results were good. In 90 per cent. the pains were diminished; complete amnesia was obtained in 46.2 per cent., partial in 44.7. Analgesia was complete in 32 cases, partial in 31; 2 failures.

City of London Lying-In Hospital, Ley and Berkeley
(135 cases).

Of the cases, 128 were primiparæ. The first injection was given with the cervix two fingers dilated and pains strong and regular. The second dose was given 45 to 60 minutes after the first and succeeding doses at hourly intervals. The number of injections varied from 1 to 53, average 13.1. Morphia was repeated in 1/6 gr. dose in 7 cases when consciousness was being gradually regained, and produced a satisfactory return to the twilight state.

Catheterization was, as a rule, necessary during labor. Complete amnesia was produced in 47.4 per cent. of the cases; partial in 45.2. Complete analgesia was produced in 8.2 per cent.; partial was present in 22.9; excluding in each case those patients in whom there was complete amnesia. Thirst was present in 63 per cent. of the cases, nausea and vomiting in 24. Mental confusion was marked in 24 per cent., slight in 34. Restlessness was considerable in 25 per cent., slight in 17. Excitement was present in 35 per cent., and a small proportion of these were maniacal. In 34 per cent. the pains appeared subnormal, and in 1 case there was complete suppression. The interval between the pains was in all cases normal. Bearing-down efforts were, as a rule, subnormal; they were good in 44 per cent., fair in 3, slight in 40, very slight in 3 and absent in 10 per cent.

In the discussion, W. O. Greenwood announced that in his 240 cases there had been only 2 complete failures. He thought his success depended on frequent and rigid testing of patients. While the dose could be standardized, patients differ in their reactions to the drugs. Morphia, 1/4, and scopolamine, 1/100, were used. He believed if amnesia was perfect it was safe to say there was some analgesia.

J. M. Brydone found the memory test unsatisfactory, and—

Comyns Berkeley said the test was no good.

The President, G. Blacker, in a subsequent paper⁸ epitomizes his views by stating it seems impossible to escape the conclusion that twilight sleep is not a condition to be considered as free from dangers. It is not suitable for general use, and its disadvantages must be held to outbalance its advantages.

[The reports seem to be good, but the President summarizes the matter by condemning twilight sleep. Evi-

dently conditions were reported at the meeting that do not appear in the abstracts here presented. The Editor, as is well known from his many statements, is not an ardent advocate of twilight sleep. As a routine he condemns it, and for the general practitioner it is not recommendable. Yet the Editor frequently uses—as he has done for 20 years—scopolamine (or atropine) and morphine in the first stage of labor, and occasionally practices the Freiburg method in full.

Is it to be anticipated that the Freiburgers, after the War is over, will try to revive interest in twilight sleep, and draw to their klinik even their quondam enemies? Their clever advertising propaganda only failed of being a prodigious financial success because of the outbreak of the War. Nevertheless we are grateful to them for it, since it has done much to draw attention to the child-bearing woman and her sad lot, and we have undertaken measures to alleviate it.—ED.]

Tyramin as an Adjunct to Morphine. H. G. Barbour⁹ observes that the use of morphine in labor has become frequent. It exhibits 3 important effects, the first desirable, the others untoward, namely, analgesia, respiratory depression in the child, and delay of labor.

The value of morphine itself in labor has, however, been acknowledged. In view of this it would seem that a substance having actions more desirable than those of scopolamin might be found which could be suitably combined with morphine.

Tyramin is an active principle of ergot. Its power to raise the blood-pressure deserves more attention because of the advantages which it has over epinephrin in eliciting a more prolonged response and in lending itself readily to subcutaneous injection.

In 5 normal individuals, Barbour and von Glahn concluded that doses administered simultaneously with a therapeutic dose of morphine will completely antagonize the depressant action on the respiration. The respiratory stimulation by tyramin is probably indirect and due to an augmentation of oxidative processes.

The employment of tyramin-Roche as an adjunct to morphine is now under investigation. The laboratory

data are being well corroborated. The dosage employed is 16 mg. of morphine sulphate hypodermically in solution with 40 mg. of tyramin. In the absence of contraindications, this injection is given when discomfort becomes marked in the 1st stage. Analgesia appears to be as complete as though morphine were given alone.

The respiratory rate of the mother becomes slightly increased rather than decreased, and usually remains somewhat accelerated throughout. The condition of the children has been quite satisfactory, no tendency to asphyxia having been observed. In every case the frequency of the contractions has been increased within five minutes, and this augmented activity maintained throughout. Forty mg. of tyramin produce a temporary rise in blood-pressure usually amounting to 20 to 25 mm.; this seems to be negligible in normal cases, but should be borne in mind and followed closely.

Pending more complete data, there seems no objection to the employment of tyramin and morphine by those obstetricians, and only those who are thoroughly versed in the use of morphine in labor.

Nitrous Oxide Analgesia—A Study of 476 Cases. W. C. Danforth¹ describing his experience states the administration is begun usually at the end of the 1st stage. In multiparæ often a little earlier, particularly and primarily if the pains cause real suffering. The operator should keep one hand on the fundus so the oncoming pain may be felt at the earliest moment. One of the most essential things is that the administration should be begun very early in the pains, if possible before the contraction is appreciable as pain. Failure to observe this rule will lead to indifferent success.

Cyanosis is to be avoided and is not necessary. Any tendency to blueness or drooping of the eyelids indicates too much gas has been administered and the patient is in danger of passing into anesthesia. The admixture of oxygen may be varied in different cases. No hard and fast rule may be given as to the percentage to use. They have tried various methods, in some cases giving nitrous oxide alone for the first two or three breaths and then

(1) Amer. Jour. of Obstet., October, 1917.

adding 5 to 10 per cent. oxygen; while in a considerable larger number they used gas alone, only adding oxygen if a little cyanosis appeared or the patient happened to require gas clear through the pain.

When violent and frequent expulsive pains render laceration imminent, control of head difficult, and relief of pain less easy, a little ether may be added to the gas-oxygen during actual delivery.

In case the child is born cyanosed the mother should be allowed to inhale oxygen for a few breaths before tying off the cord. The child will almost immediately receive the oxygen and its color will promptly become better. This maneuver is of considerable value.

[It is very easy to imagine such an action, when in reality the change in color is due to natural causes.—ED.]

Some 201 cases received the gas from five minutes to one hour. Of these 182 could be characterized as satisfactory; 24 were varyingly characterized as poor, fair or fairly satisfactory. In 159 gas was given from one to two hours; 19 were not satisfactory, 140 satisfactory. Some 79 were given gas from two to three hours; 14 were not satisfactory, 65 satisfactory. Twenty cases were given gas for from three to four hours; 1 was not good. Five cases received gas from four to five hours; all satisfactory. Two were given gas from five to six hours; both satisfactory. Three cases received gas from six to seven hours; 2 satisfactory and 1 not. The percentage of unsatisfactory administrations is 7.5.

The condition of the babies was carefully observed. Thirty-two were recorded as "asphyxiated," but in 12 some other reason existed than anesthesia.

De Lee believes the use of gas longer than three hours carries with it some danger of hemolysis.

It requires some care and attention to become an efficient administrator, and Danforth's feeling that some experience is necessary has gradually become stronger.

Nitrous Oxide Analgesia. The first case where nitrous oxide was employed for prolonged *analgesia*, in contradistinction to *anesthesia for operation*, of which J. C. Hoag² has any knowledge, was one attended by

him, on July 13, 1913. Frank Lynch was called in after the patient had been taking the gas for four or five hours and reported this use of nitrous oxide in a paper read before the Chicago Medical Society, March 24, 1914.

Hoag believes we have allowed our patients to suffer unnecessarily and in the future we can conduct cases *tuto, cite et jocunde*, by morphine (and chloral if we choose) early in labor and nitrous oxide with a little oxygen later on, employing in some a modicum of ether when we have operative work to do. Prolonged gas analgesia (*e. g.*, for 6 or 8 hours) is perfectly safe for healthy patients, if properly managed. Gas tends to shorten labor, and does not lead to physical depression and post-partum hemorrhage. The proper technique can only be learned by very considerable experience, the best results being only obtainable by experts. Obstetric analgesia is more difficult than surgical anesthesia with gas. In hospital obstetrics gas should be given in most cases, but only by experts, just as for surgical cases. We should have experts when we care for obstetric patients in their homes. Most women who have had gas administered experienced some relief, but not what was their due. Very little oxygen is required and all along we have been using too much of it. In obstetric analgesia the re-breathing bag makes only for a small economy and is in some respects objectionable.

Chloroform, Ether and Nitrous Oxide-Oxygen in Pregnancy and Labor. A series of animal experiments was carried out by C. H. Davis⁸ which seemed to justify the following conclusions:

1. The administration of chloroform, ether and nitrous oxide-oxygen to pregnant or nonpregnant guinea-pigs, if given over long periods and repeated on successive days, causes degenerative changes. Those in the liver are the most constant. Those following chloroform most severe.

2. If the degeneration is not sufficient to cause death, the animal gradually recovers, but it seems probable the results may persist for a considerable time.

(8) Amer. Jour. of Obstet., October, 1917.

3. With ether-gas the changes are chiefly those of cell asphyxiation, yet the cells recover more slowly following ether than after nitrous oxid. The central necrosis following chloroform is very different from that in asphyxiation and more permanent.

4. The long-continued use of these anesthetics must be considered dangerous to the fetus in utero. Chloroform and nitrous oxide anesthesia seem more dangerous than ether. The continuous nitrous oxid-oxygen analgesia, while less dangerous than the anesthesia, should not be administered over long periods.

5. The marked fatty degeneration of the livers in all 3 of the young born after their mothers had only one hour of chloroform-oxygen anesthesia shows that pure oxygen does not remove the danger of chloroform.

6. The changes following nitrous oxide being identical with those after ordinary asphyxiation, it seems fair to believe them due to long-continued interference with cell oxidation.

7. There is no reason for believing the intermittent use of four or six inhalations of nitrous oxide-oxygen at the beginning of the uterine contractions can be of any material danger to the fetus. The nitrous oxide absorbed has been largely eliminated by the end of the contraction and normal metabolism is not disturbed during the interval.

8. Since anesthesia during pregnancy may be a source of considerable danger to the fetus, it is believed operations should be avoided, if possible, during this period. The fetus in utero and the new-born would appear to stand ether *anesthesia* better than chloroform or nitrous oxide-oxygen.

As a result of his study Davis would urge that obstetric patients as well as surgical be thought of as individuals. The analgesic or anesthetic should be chosen for the operation and the peculiar needs of the patient. Ether, unless contraindicated, is the inhalation anesthetic of choice for long operations during pregnancy or labor. Nitrous oxide-oxygen for examinations and short operations.

There is no clinical evidence to indicate that the inter-

mittent inhaling of chloroform in labor is as dangerous as when given for anesthesia, but in view of its greater toxicity, there seems to be no logical reason for its continued use.

When an analgesic is needed early in labor, he advises an opiate, either alone, or with chloral or scopolamin.

During the painful 2d stage, ether for most patients is less satisfactory than nitrous oxide-oxygen but more desirable than chloroform. Nitrous oxide-oxygen with most obstetricians has proved itself the most valuable analgesic. No treatment is a panacea, but by the adaptation of the analgesics to the needs of the patient great relief can be given in every case.

In the discussion J. B. De Lee asked if any hemolysis in the mother had been observed where nitrous oxid is given. In the early days when enthusiastic about it, he began its use in a case when the cervix was two or three fingers dilated. She had acute hemolysis which resulted in acute post-partum hemorrhage, with general icterus, and bile in the urine. Since then he has kept down the use of the oxid, and gone back to ether.

To this query Davis answered, "No."

[In the main Davis' conclusions from his experiments agree with mine, drawn from a not-small clinical experience. Without question the use of anesthetics and analgesics increases the number of operative deliveries. If we used them in the out-service of the Chicago Lying-in Hospital (1600 cases per year), as liberally as I do in my private practice—we would not have men enough to do the numerous forceps deliveries that would be required. In my private practice every woman gets some kind of analgesic, and fully 25% of the cases are terminated by forceps, or episiotomy, or both.

I still prefer ether, and my associate, Dr. Anna R. Lapham, thro' 20 years' practice has developed great skill in its administration as an analgesic, so that we seldom feel the need of N_2O and O_3 , tho' we use this combination occasionally. For all-around obstetric purposes, ether is the safest and best. Let us not forget that local and regional anesthesia also have a place in obstetric practice.—ED.]

PLACENTA PREVIA.

Pituitrin in Placenta Previa. This proved of value in the case narrated by A. Lipkis.⁵ The patient, aged 30, when about 3 months advanced, noticed signs of bleeding. She was advised to stay in bed until all signs of blood disappeared. When 8 to 8 1/2 months advanced, and apparently in good health, she suddenly had a big hemorrhage, four hours later another. She was sent to hospital with a diagnosis of placenta previa marginalis. It was decided the best treatment would be a Cesarean, but to postpone it as long as possible while not bleeding; meanwhile for her to stay in bed.

On 2d night Lipkis was called as she was in labor and bleeding. When he arrived, pain and hemorrhage had stopped, the cervix was three fingers dilated. When the pain and bleeding returned she was given 1/4 c.c. pituitary extract. The pains increased but bleeding stopped. His intentions were to repeat the dose if hemorrhage returned, but it was not necessary. A half-hour after the injection the head was born. She was given another 1/4 c.c. when head was born. Placenta hastily delivered and the uterus packed for 24 hours; uneventful recovery.

[By letter, Dr. C. V. Rice, of Muskogee, Okla., reports a similar case with happy result. At the World's Congress in London, 1913, the recommendation to use pituitrin was made, and without doubt it has been thus employed many times. The Editor knows of no case of rupture of the uterus, caused by pituitrin in placenta previa. Does any one of our readers know of one? Theoretically one should condemn such use of the drug, because the thin, vascular lower uterine segment is particularly prone to rupture in placenta previa, and this vulnerability would be developed and exaggerated if the pains are very strong, as they will be with pituitrin. In case of low implantation of the placenta—or a previa lateralis, with the cervix soft and nearly completely dilated one might give a small dose of pituitrin to stimulate the pains, but hold the ether nearby to moderate them if the effect be too strong. We want slow dilatation

of the cervix and lower uterine segment in placenta previa.—ED.]

Antepartum Hemorrhage, Gas Bacillus Infection, Phlegmasia. In a woman, of 28, under the care of W. Sanders,⁶ while in the 7th month of her sixth pregnancy, a small hemorrhage without pain occurred, to which she paid no attention. Some 3 weeks later another painless hemorrhage took place also without pain, but this time was very profuse. Sanders did not reach her for 3 hours, as she lived in the country. The vagina was packed and 1 c.c. of pituitrin administered. Pains now started up, a full-strength H. M. C. tablet was given, and a small child delivered by version about two hours after his arrival. Before and during delivery she was given saline solution by hypodermoclysis with an apparatus, improvised with a fountain syringe and a large needle. The needle was introduced under the breast and then into the abdominal wall. The technic was faulty, and in both places she became infected with a gas-forming bacillus. This started within a few hours, because she began to complain of pain by 9 p. m. In a few days the temperature was 105°, and symptoms of phlegmasia appeared. The gas bacillus infection subsided after free clearing out of both foci, with eventual recovery.

COMPLICATIONS.

Etiologic Classification of Pelvic Deformities. D. B. Hart⁷ states a primary question is, "When are we to consider a female pelvis deformed?" It is not enough to say that the bony pelvis is deformed when labor is obstructed, as this cause may lie with the fetus or uterine and pelvic elastic tissues. We must therefore define bony hindrance from the capacity of the true pelvis relative to the fetal head. The deformity may be at the brim, in the cavity, or at the outlet, the brim and outlet are most important. No original classification is given in any British and American text-books,

(6) Kentucky Med. Jour., March, 1918.

(7) Edinburgh Med. Jour., August, 1917.

but Williams and De Lee quote Litzmann's, Tarnier and Budin's, and Schauta's. All the given classifications are anatomic or dimensional: Schauta's to a certain extent is etiologic, but none are consistent, although in many cases convenient. [Consistency is impossible.—ED.]

Hart's *etiologic classification* is as follows:

GROUP I. From anomalous antenatal distributions of size—symmetric.

1. *Æquabiliter justo-major.*
2. *Æquabiliter justo-minor, non-rickety.*
3. *Dwarf pelvis.*

GROUP II. From antenatal losses of determinants at maturation; from variation in assimilation of promontory.

1. Loss of chromatin determinants at maturation (ejection of polar bodies), causing absence of certain factors of adult unit characters.
 - (a) *From loss of certain determinants for size and nutrition of one ala sacri (NÆGELE PELVIS).*
 - (b) *From loss of certain determinants for size of both alæ sacri (ROBERT PELVIS).*
 - (c) *From failure in closure of cloacal membrane and symphysis mesoblast (SPLIT PELVIS).*
 - (d) *From high and symmetric or lateral assimilation of sacral promontory (FUNNEL-SHAPED PELVIS).*
 - (e) *From loss of determinants for sacrum (ABSENCE OF SACRUM).*
 - (f) *From loss of determinants for part or entirety of first sacral vertebra.*
 - (g) *From partial inversion of pelvic determinants for anterior and posterior segments of bony pelvis.*
 1. *Iliac inversion giving non-rickety justo-minor pelvis.*
 2. *Ischiopubic inversion simulating funnel-shaped pelvis.*
 - (h) *From loss of determinants of size and nutrition for bones arising in early endochondral ossification (ACHONDROPLASTIC PELVIS).*
 - (i) *From non-union of ossific nuclei of last lumbar vertebra (SPONDYLOLISTHESIS).*

GROUP III. From disturbed and increased or absent leg resistance owing to—

- a. *Club-foot.*
- b. *Prone pelvis (Liegebecken).*
- c. *Defects, curvatures, or dislocations of lower limbs.*

GROUP IV. From overweighting of pelvis by early undue pressure in childhood (*Flat non-rickety pelvis*).

GROUP V. From previous constitutional bony disease causing pelvic deformity owing to incomplete resistance of pelvis to downward body weight and upward leg resistance. The bony disease may be—

- a. Rickets.
- b. Tuberculous caries.
- c. Osteomalacia.

(a) Rickets.

1. *Simple flat rickety pelvis*.
2. *Scoliorhachitic flat pelvis*.
3. *Flat rickety generally narrowed pelvis, with iliac inversion*.
4. *Pseudomalacosteonicrachitic*.

(b) *Tuberculous disease of ilio-sacral synchondroses on one or both sides*.

1. *One ilio-sacral joint involved (PSEUDO NAEGELE)*.
2. *Both ilio-sacral joints involved (PSEUDO ROBERT)*.

(c) From osteomalacia (**OSTEOMALACIC PELVIS**. See, however, V. (a), 4.

GROUP VI. From tuberculous caries of spine, with pelvis free.

- a. From tuberculous spinal kyphosis (**HUNCHBACK PELVIS**).
- b. From combination of spinal kyphosis and scoliosis (**HUNCHBACK OBLIQUE (KYPHOSCOLIOSIS)**).

GROUP VII. From new growths.

GROUP VIII. From nervous dystrophy.

GROUP IX. Miscellaneous, and comprising conditions not interfering with labor.

[This is a valuable addition to our other classifications. Those interested in the subject should not fail to consult the wonderful work of Breus and Kolisko.—ED.]

Cesarean Section on Second Day of Labor. The woman seen by J. H. Martin⁸ had been almost two days in labor at home and been repeatedly examined by the midwife. The membranes ruptured several hours before admission. As no progress was being made a doctor was called, who ordered her removal at once to the Maternity Hospital. When examined the head was presenting in a much-contracted pelvis. As the fetal heart was good Martin decided to perform Cesarean section and risk sepsis.

The operation was carried out according to Prof. Cameron's method except as to delivery of the after-birth. The placenta and half of the membranes were freed, cut off with scissors, and delivered through the uterine incision. The remaining membranes were pushed through the cervix with swabs into the vagina, thus eliminating the risk of infection from the membranes actually touched by the examining fingers. Where infection is probable from vaginal examinations, some operators push the placenta and membranes through the cervix into the vagina; but if the placenta be large and the pelvis considerably contracted, the procedure is not easy.

The patient was nursed for 10 days in the Fowler position. Uninterrupted recovery, due, he is sure, to the method in dealing with the membranes and the Fowler position.

[The Editor can not agree with this explanation, rather he believes the patient got well by grace of the immunities she possessed against the bacteria, or—and this amounts to the same thing—the bacteria were not virulent. Whitridge Williams of Baltimore has proven that very soon after the bag of waters is ruptured, bacteria from the vagina invade the *whole cavity* of the uterus, and from other experience and experiments we know that within a few hours, infection introduced is transported many inches in all directions. It does not remain on the surface. This case should not shake the conviction that Cesarean section is a risky procedure in such cases as Dr. Martin's. If it must be done—one of the transperitoneal or extraperitoneal cervical methods should be chosen.—ED.]

Double Obliquely Contracted Pelvis, With Acute Lumbar Lordosis Due to Infantile Paralysis. The patient referred to by E. M. Lazard⁹ was a negress, aged 39. I-para at term. Began to walk at about a year old, when 6 was run over. Since then has been unable to stand and walks on all fours. Impossible to straighten limbs out. Owing to this and the frequent pains, pelvic measurements made with considerable difficulty, these showed diameters as follows: Interspinous, 23 ctm.; in-

tercristal, 20; ext. conjugate, 15; right oblique, 19; left oblique, 18; diagonal conjugate, 9.5. (These were confirmed following delivery.)

At each contraction the head rode over symphysis and did not engage. Cesarean section was evidently indicated both from the highly contracted pelvis and the change in its inclination. When uterus was partly delivered it was found there was a large fibroid on the left horn and a smaller one immediately adjacent. On delivery of the uterus, the Cesarean incision, which was immediately under the midline, retracted far behind the right abdominal wall. This was caused by the straightening out of a torsion of the uterus to the left, which had been caused by the large fibroid. As Lazard thought it would be a simple matter to remove these fibroids, he sewed up the Cesarean incision. On delivering the uterus entirely out of the wound, it was found to be fairly studded with numerous fibroids of varying sizes, so a supravaginal hysterectomy was immediately performed. Rapid convalescence.

Though patient dated her crippled condition from the injury, that probably was a mere coincidence, as by

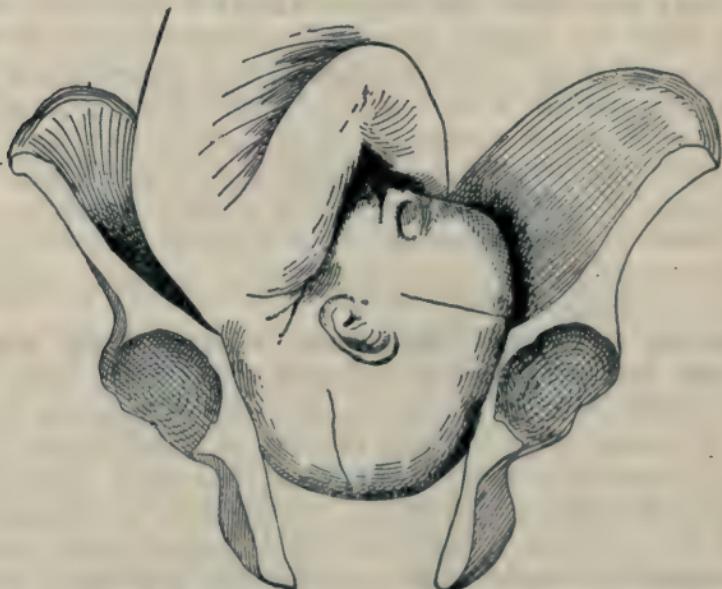


Fig. 8. Head well flexed in moderately contracted pelvis. When arrested at this stage it is unfavorable to the application of the forceps (Zinke).

x-ray there was no traumatic condition found; she had a practically complete motor paralysis of the left leg, and partial of the right thigh. She stated that after the injury she suffered with "spinal meningitis."

Management of Labor in Narrow Pelvis. For the more moderate contraction, 9 cm. or up, the procedure is easily determined. First, the test of labor, in the great majority, terminates in spontaneous delivery and a living child; if labor is very slow, the os fully dilated and head well flexed and fixed at the inlet, forceps are justifiable. This, however, should be the limit of the so-called high application of the forceps in narrow pelvis, and the instruments should never be applied in these cases when the head is arrested above the brim.

In the second degree of narrow pelvis, 9 to 7 cm., E. G. Zinke^{9a} believes the problem as to which mode will give the best result for both mother and child is not so easily solved. Even in these cases labor may terminate spontaneously; but version, forceps, pubiotomy, craniotomy, embryotomy, and Cesarean section, may suggest themselves.

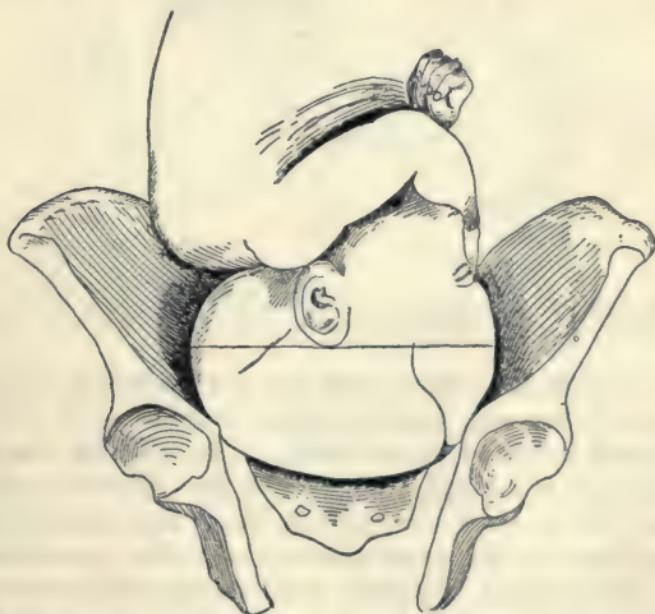


Fig. 9. Head above brim in justo-minor pelvis; deflected, and unfavorable for the application of the forceps (Zinke).

Mueller's method of pressing the head into the inlet commends itself highly. [The Editor finds it disappointing.] One hand of the attendant, or, better still, both hands of an assistant, press the head into the pelvis through the abdominal wall from above, while one finger in the vagina is in contact with the

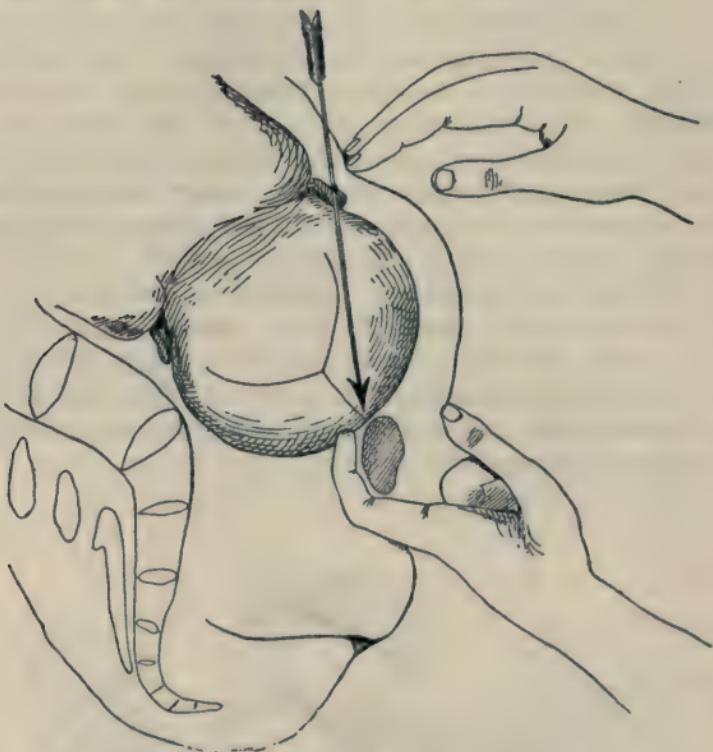


Fig. 10. Mueller's method of pressing the head into the contracted pelvic inlet (Zinke).

head. In this way the head lies between the examining hands and we can judge, with considerable accuracy, its size and relation to the brim. The smaller the pelvis, or the larger the head, the greater the difficulty of pressing the latter into the pelvis, and the more may we see and feel its globular shape above the symphysis.

One of the most valuable indications of the size is the sagittal suture. If this runs transversely close to the promontory or the symphysis, and only a small portion of the upper parietal bone can be felt, the disproportion

between passage and passenger is great; if, however, the sagittal suture is near the axis of the pelvic cavity, and both parietal bones can be palpated over a considerable extent, the disproportion is small.

What of the use of forceps in cases of narrow pelvis? There is a place for them. When a well-flexed head

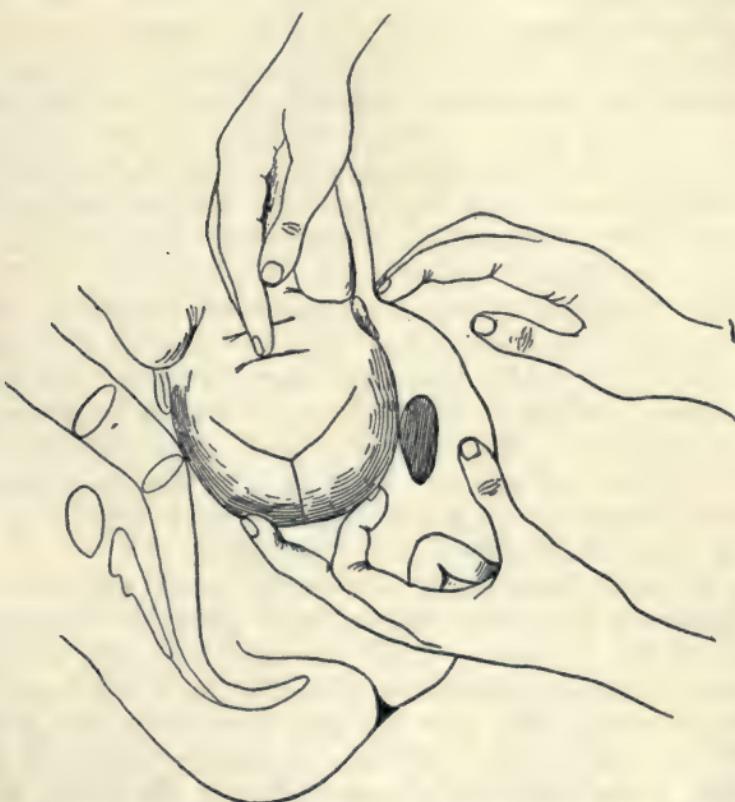


Fig. 11. Shows the disproportion is not great and the head forced into pelvic cavity by Mueller's method (Zinke).

presents in a favorable position and is fixed in the inlet and labor is arrested in spite of vigorous contractions and brave efforts at bearing-down, it is well to think of forceps. Under such circumstances prophylactic version is not justifiable.

If after an intelligent, earnest, and a moderate attempt at delivery with the forceps nothing is accomplished, the choice lies between perforation, pubiotomy, or heosteotomy and, possibly, Cesarean section. Repeated and protracted efforts with the forceps, under

the conditions just described, cannot be condemned too severely. The forceps should never be applied to a head floating loosely above the inlet.

Treatment of Malpositions. There are 2 main causes, according to J. W. Markoe:¹ Variations and deformities in the parturient canal, and abnormalities connected with the child.

In normal presentations, *i. e.*, the 2 anterior positions of the occiput, there is rarely malposition, unless one considers the pendulous abdomen when the presenting part is forced rather toward the promontory than into the brim. The most difficult case is where an old ventral suspension pulls the anterior wall of the uterus directly down toward the symphysis, and intervention is not infrequently called for.

O. P. positions should be considered abnormal, as in a given number, the occiput fails to rotate to the front; yet many do rotate and are born without untoward symptoms. When the head does not rotate, it is usually due to failure to flex properly so it may pass forward under the ischial spines. This may be due to a relaxed perineal floor, or to a combination with ischial spines projecting abnormally within the pelvis.

In all such cases when seen early, every effort should be made to complete flexion and produce downward pressure by posture. This, in the majority of cases where the proportions between mother and child are relatively normal, will end the case by converting it into an O. A. presentation. Where for some reason this fails to take place, there is a possibility of the birth being completed without injury if the forces are adequate and the maternal tissues so distensible as to allow the passages of the persistent O. P. In some the rotation may be accomplished by using one blade of the forceps as a vectis and then assisting the head to rotate, but the forceps, applied as they must be in such a case, is dangerous.

In the more severe cases, especially in a small primipara with a large child, operative measures will have to be adopted according to exigencies. Brow and face cases may be taken together as the treatment is virtually

the same, and the same rules apply to these cases as in the O. P. positions. Some will come through without aid and in other cases intervention will be necessary. Whenever a case presents in this way at the brim, and efforts to convert it into an occipital presentation fail, it is wiser, where possible, to perform a podalic version before the presenting part becomes impacted. Rarely will it be necessary to do more if the pelvis be normal. Where there is certain dystocia due to the pelvis, abdominal section may be indicated, but this has never presented itself to Markoe.

[Manual conversion of the occipito-posterior to anterior position, using the whole hand to grasp the shoulders of the child, is more successful than version.—ED.]

Breech presentations are one of the most difficult classes to deal with, as one never accurately knows what the relation of the aftercoming head bears to the pelvis. If the bones of the skull are soft and the fontanelles large, allowing of easy over-riding, there is likely to be but little difficulty, but in a firmly made bony head with very little resiliency, there is apt to be danger to the child. Therefore, before undertaking a case known to be a breech every preparation should be made to meet emergencies, such as instruments for craniotomy. A breech case should not be undertaken without skilled assistance, as the management of the head from above must be, next to the extraction, the most important step. One of the cardinal rules is to prevent if possible rupture of the membranes. The full breech is a better dilator than the half breech, so it is never wise to pull down a foot until the operator is ready to deliver, or where the membranes have already ruptured and it becomes necessary to begin traction to complete the dilatation. Great care must be taken not to injure the cord and to release slowly the extended legs or arms so as not to cause a dislocation of the epiphysis or a fracture.

Shoulder presentations usually indicate a deformity, either in the uterus itself or a pelvic deformity which prevents the normal presentation to continue. They are comparatively easy if seen early and the membranes have not been ruptured. They may be converted into a vertex or breech and continue to a normal ending,

but this is extremely rare. In these cases posture is of more assistance than any other method up to the time the membranes rupture; then there is nothing left but perform a podalic version taking it for granted the pelvis is sufficiently normal to allow the passage of the aftercoming head. In long neglected cases there is, of course, great danger of rupturing the uterus especially in old multiparæ where the cervix has been previously ruptured and is friable.

Prolapse of the cord, in rare cases, can be replaced in the knee-chest position and the child then delivered by the best adapted means. Here again a resort to podalic version may secure a living child, especially where the pelvic canal is large and the perineum not a barrier. Instruments have been devised for replacing the cord, but no better one exists than the ordinary sterile catheter with a stilet to carry the loop of the tape which is passed through the catheter and brought out of the eye, thus being looped over the cord and the tape passed over the head of the catheter; the cord is thus held firmly and will easily carry the cord well up into the uterus. On withdrawing the stilet the tape will slip off the head of the catheter and the cord be released. If this does not occur, it is wiser to withdraw the stilet and allow the catheter to remain in the uterus. It can do no harm.

These are the main malpositions which are met, and yet, in an experience of 30 years, Markoe can truly say that no two cases present exactly the same features. What is needed is a most careful study of each case that comes to us and a realization that obstetrics is, first and foremost, a truly surgical procedure, and if an obstetrician be surgically clean in all his technic his results for mother and child will be greatly improved. Sepsis is the leading cause of death to the former in all confinements recorded. This is graphically demonstrated from time to time in large hospital services where cases are sent in with rupture of the uterus. It is his regular practice in all such cases to take a culture with the greatest care from the vagina and one from the uterus before even a finger is introduced into the canal. The

results are according to the infection. A hysterectomy is performed and if the culture is sterile, the patient usually recovers promptly, but where the cultures are positive, death is the rule.

Abruptio Placentæ Complicating Nephritic Toxemia. The patient referred to by L. L. Bottsford² was 30 years old, and admitted to the Clinic (Ann Arbor) May 31, in the 7th month of a fifth pregnancy. In good health until April 1, when she had bronchitis and cough. Dyspnea appeared, followed shortly by edema. For 3 weeks prior the dyspnea and generalized edema had been increasing markedly, and she passed decidedly less urine. At times had asthmatic attacks and unable to sleep lying down.

Moderate hemorrhage began the evening of admission, and continued for several hours, but gradually lessened after packing cervix and vagina with gauze. After about 12 hours' stay, there was spontaneous delivery of a stillborn male fetus. Immediately following the fetus considerable old dark blood escaped. The placenta was immediately delivered by the modified Credé method, coming away intact, and with it were several large dark clots, one as large as a fullterm fetal head. The entire surface of the placenta was dark in color and covered with old clot. The uterus contracted down well and remained in good condition with no bleeding. Ergone, however, was given prophylactically. The patient was allowed out of bed on 9th day, when pelvic examination showed normal involution. The urine, however, failed to clear rapidly even with eliminative treatment and diet.

There were none of the suggested factors present, as trauma, short cord, mental emotion, endometritis, or placental abnormality. Instead, a definite case of nephritic toxemia of severe grade terminating as per rule at the 7th month. Even had she not developed premature separation the fetus would have had very little chance for life, by reason of the severity of the toxic state and her stage of pregnancy.

Abruptio Placentæ, Delivery of Live Child by Cesarean Section. D. S. Hillis⁸ in his report of this case states the patient, a primipara of 35, was in the 9th month of pregnancy. For 30 days there had been a small amount of albumin in the urine, but no casts. Maximum blood-pressure was 120. May 12, after being struck by head of 3-year-old child, there was considerable pain for a time. Four days later, after a short walk, there was moderately severe pain and continuous. In an hour small amounts of fresh blood began to escape continuously. Examination at the Chicago Lying-in Hospital, 3 hours after onset of pain showed:

No shock; pulse 94; uterus tense with increased tenseness at intervals of 2 to 6 minutes, accompanied by pain. Fetal parts difficult to outline, but back seemed to be to the left, head movable, floating above inlet. Fetal tones were from 140 to 148, but somewhat variable. Rectal examination showed cervix not effaced, about 3 to 4 cm. long. The os hardly admitted one finger. About 1/2 oz. of very dark colored semifluid blood was expressed from the vagina. At 4 p. m. the heart went to 176, with slight irregularity; otherwise condition the same. At 5:30 heart tones 164 to 168, and somewhat irregular. Slight contractions, irregular, at intervals of 3 to 7 minutes. Palpation of uterus immediately caused a tenseness of the wall, equal to the spontaneous painful contractions; the uterus at all times was firmer than normal, and slight bleeding continued, some of which was bright in color. Rectal examination showed no change, more thick dark blood was expressed.

At 6:30 under ether, classical Cesarean section done. Child not asphyxiated. On removal of the baby, a clot was seen lying in the opening of the uterus, and on introducing the hand, was expelled on to abdominal wall. The position of the placenta showed it was not previa. This clot was a biconvex disk, 14 cm. in diameter and 4 cm. in its thickest portion. It weighed 15 oz. The surface and edges were regular, except in one part. This clot was very firm, almost black, and retained its integrity in spite of much handling. The placenta was lying on the posterior wall, with its edges near the

incision. The uterus did not contract well, and 1 1/2 ampules of pituitary extract were injected into its wall directly. This caused a fairly satisfactory contraction, but less than is usually secured by similar administration of 1 c.c. During suture of the muscle walls, it was noticed the peritoneum over the entire surface of uterus appeared mottled, evidently due to small hemorrhages under the serosa. (The uterus had been subjected to only a minimum amount of trauma.) The uterus now was contracted in a satisfactory manner, and it was decided not to remove it. The placenta was circular, 30 cm. in diameter; the cord was centrally implanted, and the fetal surface showed no abnormalities. The maternal surface did not show a well-marked area of depression, corresponding to the size of the clot, although there was a considerable area, irregular in shape, where the placenta was thinner and somewhat paler.

The diagnosis was based on the history; the sudden onset and character of the pain; marked irritability of the uterine muscle; abnormal tenseness of the uterus, and the bloody discharge appearing one hour after the pains; and in spite of the continuance of the heart tones and the absence of signs of shock, their absence was accounted for by the fact that the separation was not sufficiently large to kill the baby or produce shock. The patient, who was robust, went home with her baby in excellent condition on the 14th day.

Premature Separation of the Normally Implanted Placenta. Two examples of this are reported by A. H. Morse⁴, in one of which he examined the extirpated uterus and in the other a complete necropsy was made. In both the fetus was dead. The striking feature was the cyanotic appearance of the uterus, which was tense, firm, and had lost its contractility. In the case which recovered there was concealed hemorrhage, while in the other, hemorrhage was both frank and concealed. The chief findings were vascular extravasation intramuscularly with the mural veins distended, with or without thrombosis being evident.

Some animal experiments were made to elucidate the etiology. He first thought that the infiltration of the

muscular coat of the uterus with blood was due to over-distension of that organ. He accordingly over-distended the cornu in a dog, without, however, causing hemorrhage into the muscular tissue. A case of fibroids with twisted pedicle set him right, and he next operated on rabbits. Here the veins are in 3 groups—ovarian, mesometric and utero-vaginal. Tying one or two groups of veins on one side failed to cause serious damage, but ligature of all three caused separation of the placenta with extravasations in the myometrium. The untreated horn remained normal.

Glinski's patient far advanced in her 9th pregnancy, was suddenly seized with severe pain and died before treatment could be attempted. At necropsy, the uterus, deeply cyanotic and with a relatively long cervix, was found rotated out of its normal position, 270° to the right. The cavity contained fluid and clotted blood; the attachment of the placenta was partially broken; the myometrium was purple and there was venous engorgement of a notable degree. Closer attention should be given to the degree of support the abdominal wall affords the uterus, especially in multiparae.

[The theory that torsion of the uterus gives rise to abruptio placentæ is interesting. Possibly some cases are due to this, but most often a toxemia is to be found.
—ED.]

Dystocia From High Abdominal Hysteropexy. The details of this case furnished by G. Lepage⁵ are as follows: The patient, a III-para, of 31, was admitted Nov. 12, 1914, with the history that the bag of waters had burst the night previous. In 1902 she had given birth to a boy, in November, 1903, hysteropexy was done, and in 1907, she gave birth to another boy. In labor, 12th to 15th, night of the last date there was more progress, the shoulder presented with retraction of the uterine wall on the fetus. It was decided to operate instead of waiting any longer, in spite of frequent cough from generalized bronchitis on left side. Cesarean section with total hysterectomy done, and living girl extracted; uneventful healing.

Why was it this patient had a normal labor after the hysteropexy, then an abnormal one? Lepage thinks possibly the adhesions became fibrous and more resisting with time. More probably, as the uterus was not mobile, the fetus had to accommodate itself transversely. The premature rupture of the membranes occurring, the uterine wall contracted down on the fetus in malposition. Hence it was impossible to perform external version, and even if dilatation was carried out, internal version would have presented the greatest difficulty.

Rupture of a Pelvic Hematoma During Instrumental Delivery. This, according to T. H. Cherry,⁸ is apparently the first case on record complicating the 2d stage. In an obese XI-para, aged 38, axis-traction forceps had been applied for an hour. As the head appeared on perineum and further traction was exerted, dark clotted blood was propelled with great force, striking the operator. After this, the head was easily delivered. The child which weighed 10 lbs. 4 oz., had a right-sided facial paralysis. A vertical laceration about 3 ctm. long was found on left close to pubic ramus. The gloved finger penetrated into a cavity extending up alongside of cervix and lower segment and base of broad ligament about 12 ctm. from vulva. Uterus and bladder intact. Patient in considerable shock by this time—pulse 150 and body and face pale. Cavity was packed with iodoform gauze with cessation of oozing. By the 12th day the cavity was completely healed. The child died on 5th day, apparently from meningeal hemorrhage.

The unusual condition was evidently due to an unrecognized hematoma formed during the 1st stage in the cellular tissue at the base of the broad ligament, subperitoneally and above the pelvic fascia. The collection was estimated at 4 1/2 to 5 oz., not large enough to cause acute anemia, but enough to prevent advance of the head and proper application of the forceps.

[The Editor does not recall the reference, but remembers having read of similar cases. He himself has had several cases of small hematomata forming during operative delivery.—ED.]

Rupture of Uterus. G. F. Rigden⁷ was called by a midwife on account of prolonged labor. The os was fully dilated, the head and umbilical cord presenting. On rupturing membranes the cord immediately prolapsed; no pulsation to be felt. The head was above the brim of pelvis, which was flattened in its antero-posterior diameter. Rigden performed internal version without difficulty, but in endeavoring to extract the after-coming head he caused a fracture of the cervical vertebrae and pulled away the body of child, leaving head behind and tearing through the cord in the process. The head being well pressed down by midwife, he then perforated and extracted with difficulty with a cranioclast.

On examining again after delivery of head an annular rupture of the uterus was found extending completely round the cervico-vaginal attachment except for a thin pedicle by which it was still attached posteriorly; placenta escaped into abdominal cavity. He seized the uterus with craniotomy forceps, placing one blade in the cavity and the other outside, and dragged it down through vagina; the remaining attachment he ligated as high up as possible, and so completed the separation of the uterus.

The pulse by this time was very bad, but there were no signs of hemorrhage, and, the nearest hospital being 14 miles away, he decided to adopt an expectant attitude, and in the meanwhile applied restoratives. The following day the pulse was stronger, and at laparotomy, a moderate amount of clot was removed from the pelvis, but there was no recent hemorrhage; placenta found in the neighborhood of splenic flexure; abdomen quickly closed with the exception of a gauze drain into the pelvis. Recovery.

The patient had been married four years, and had had 2 previous pregnancies; the first terminated in the expulsion of a stillborn fetus (described by the midwife as "macerated") at 8th month; the second in a miscarriage at 7th week. The uterus was normal to the naked eye, and it was impossible to determine where the rupture had commenced.

[Craniotomy on the dead child as an elective operation might have avoided all the trouble and spared the uterus.—ED.]

Rupture of Uterus—Fetus in Broad Ligament. An X-pa, who considered herself pregnant fully 3 months, had been bleeding about 8 days. Chiefly clots, and at times red blood. She had had small pains since bleeding commenced. On making an examination J. H. Martin⁸ found several clots in the vagina, the internal os admitting one finger easily. Through the os he palpated placenta, semi-detached in utero. There was an aperture in the right side of cervical canal leading into the broad ligament which, in the rapid examination, seemed filled with clot. The patient was then anesthetized, and the uterus emptied of placenta, membranes and clots. After the placenta had been delivered the cord led back to the aperture in the right side of the cervix, and passing his fingers in Martin found the space filled with clots and the fetus. These he cleared out. The uterus contracted immediately, and there was very little bleeding. The fetus seemed about 4 months.

The only reasonable explanation is that there was an imperfectly healed scar in the cervical canal, from a previous confinement. As the fetus in abortion is usually expelled early, in this case it took the path of least resistance and went through the weak scar before the external os was sufficiently dilated to allow it to pass out.

Uterine Rupture With Membranes Intact. This case, reported by H. Shufflebotham,⁹ was operated on by S. L. Graham. The woman, who was 42 years old, had had 15 pregnancies in 20 years, 13 full-term. On admission she was at the full term of her 15th pregnancy. The day before she was doing her ordinary housework until 6 p. m., when she commenced to have cramp-like, indefinite pains. The pains continued all night, and at 6 a. m. she sent for a midwife, who said she was not in labor but she must call in a doctor. At this time she had a sharp loss of bright red blood. A local doctor came later, and sent the patient into hospital. Until admission, at 2 p. m., the pains had gradually become

{8} Glasgow Med. Jour., October, 1917.
(9) Lancet, Oct. 13, 1917.

more severe and the patient felt very ill. Fetal movements had been felt until the day before. The patient was very fat and bronchitic. Temperature 98° F., pulse 130 and weak, breathing labored and quicker than normal. The abdomen was painful and tender all over. Fetal parts could not be made out definitely. (The abdominal wall was fat, and the placenta lay in front of the fetus.) By the vagina there was some dark blood; the os felt thick, it was not on the stretch, and was about the size of a silver dollar. The fetal head was felt indistinctly a long way up.

At operation the maternal surface of placenta presented immediately under the incision. The membranes were intact. There was dark clot in abdomen and the uterus was contracted down to the size of a cocoanut. It had a rupture along its upper border and was quite empty. The membranes were ruptured and the fetus removed, which showed early maceration. The placenta and membranes were then removed and subtotal hysterectomy performed. The rent was 6 inches long. At the site of rupture the wall showed marked degeneration, and its edge was no thicker than a sheet of paper. Recovery delayed by pneumonia.

This is the 3d case Graham has had of rupture of the uterus with unruptured membranes and a dilated os. In 2 the rupture was complete and the fetus and its appendages free in abdominal cavity. In the other the uterus had not quite ruptured through. Each patient has had a large number of pregnancies in rapid succession. This would appear to cause the wall to give way under the tension exerted through the liquor amnii by the contractions, but which tension is so slight as not to cause rupture of the unsupported membranes at the external os.

[One should look for decidual infiltration of the uterine muscle in these cases.—ED.]

Uterine Rupture Following Hysterotomy. A patient, aged 23, in December, 1915, had a miscarriage at 3 months. That hemorrhage might be arrested, the abdomen was opened, and the offending placenta removed (Cesarean operation after delivery!). Operative recovery prompt. Eighteen months later, she came to labor

at full term. Pelvimetry bespoke ample pelvic measurements. Mild pains appeared irregularly for about 48 hours. When seen by R. R. Kahle¹ there had been no pains for several hours. Her physician suspected rupture through the scar, although the symptoms were quite atypical. No fetal heart. The uterus and fetus could not be separately palpated. The patient stated she felt something give way about the time pains stopped. Taken to hospital and after the uterus had been explored to verify diagnosis, abdominal section was made. The dead baby was removed, hysterectomy rapidly performed, and a quart of physiologic saline administered intravenously; uninterrupted recovery. The uterus had yielded at the hysterotomy scar. Muscular union was all but nil, the infolding endometrium approximating the peritoneum—an ugly rent, indeed.

[Deaver claims there is no danger of rupture of the scar of the uterus sectioned in the very early months, or when non-pregnant.—ED.]

OPERATIVE OBSTETRICS.

Obstetric Operations. For all practical purposes I. W. Potter² classifies these as follows:

1. Forceps deliveries.
2. Version.
3. Version and extraction.
4. Forceps applied to after-coming head.
5. Craniotomy.
6. Embryotomy.
7. Vaginal Cesarean section.
8. Abdominal Cesarean section.

The application of forceps is most often resorted to and probably more damage is done than is generally admitted. Forceps are many times applied to the sides of the pelvis without any regard to the position of the head, thereby doing untold injury to the child as well as the mother. They should never be applied until the cervix is fully dilated and head in proper position. Forceps should never be used to rotate the head, where

{1} Jour. Amer. Med. Ass'n., Dec. 29, 1917.
(2) Memphis Med. Month., December, 1917.

necessary this should be done manually, under anesthesia and the forceps then applied. Potter uses short forceps, thus lessening the damage. This form is also a decided advantage when it is necessary to apply them to the after-coming head, an operation which should be more generally understood. Forceps should never be applied to the breech, nor should a hook ever be used in the groin of a living child. In breech cases it is better to bring down one or both feet, so labor can be terminated quickly.

Version should be performed more often and the forceps used less. A small hand and arm properly gloved can be introduced for diagnostic purposes and for version with less damage than forceps. Potter has had his hand in the uterine cavity over 1,000 times and has yet to find any serious damage resulting therefrom.

Craniotomy is to be considered only when the child is known to be dead, or in hydrocephalus; it may be done either on the oncoming or the after-coming head. Embryotomy is justifiable in locked twins or cases of monstrosities.

With vaginal Cesarean section the uterus can be emptied rapidly without any special danger or shock. This applies to pregnancies between the 3d and 7th months. Before the 3d the curette can be used; after the 7th or 8th months an abdominal operation is better. The indications are: 1. Eclampsia. 2. Central placenta previa. 3. Accidental hemorrhage. 4. Prolapsed cord. 5. Dangerous heart conditions in mother, and a few others, as malignancy of cervix, with hemorrhage, hydatid mole and advanced tuberculosis. The dangers to the child are those from the conditions which demand intervention, *e. g.*, the toxemia or the fact that not enough room is given to deliver. The dangers to the mother are injuries to the bladder, sepsis and hemorrhage. Potter has a series of 31 vaginal sections with no bad results.

Abdominal Cesarean section will become popular as time goes on. What is necessary is to make the general practitioner aware of his responsibility. To also have him understand that obstetrics is surgery and every case should be treated as such. It is a great mistake

to regard pregnancy as a physiologic process and leave everything to Nature. While meddlesome midwifery is not to be countenanced, many times a case is neglected for want of a thorough examination before delivery, even if anesthesia is necessary. Non-intervention, while justifiable in some cases, is in a large measure responsible for the poor obstetrics of today.

Potter can report 51 consecutive abdominal sections without a death, both early and late, cases seen with midwives and other physicians. Four were twin pregnancies. No children dead nor mutilated. Two cases have had living children through the birth canal since their operation; central placenta previa in a multipara, the other had a small baby through a contracted pelvis. A woman who has once had a Cesarean section should not be allowed to go into labor. Neither the use of bags as dilators, nor the induction of labor before term in hopes of getting a small child through a small pelvis are clean operations, nor be considered as such.

The vaginal section can be performed in an ordinary house as well as in a hospital. For the abdominal a well-lighted clinic is better, although he can see no objections to doing this at home under proper conditions.

Version—With Report of 200 Cases. This report by I. W. Potter³ is in addition to a series of 500 in a former article. Multiparæ, 115, primiparæ, 85; no maternal mortality. The chief indication was O. P. presentations (126, R. O. P., 40; R. O. A., 5; L. O. A., 3). Sixteen children were still-born, not from the version, but because of intrinsic causes lying in either an abnormality of fetus itself, the placenta or in prolapsed cord.

After experience in 6,000 labors, and regardless of textbooks or methods advocated by teachers of obstetrics, Potter gives the following opinions on this procedure: Version lessens shock, as well as the dangers due to pressure from and on the head. It should never be undertaken until the os is fully dilated or easily dilatable, but is as readily performed in primiparæ as in multiparæ.

Fetal mortality should not be so great as in prolonged labor with instrumental delivery.

Lastly, the following conditions are best treated by version: Face presentations; prolapse of the cord when the cervix is dilated or dilatable, and the cord is still pulsating; placenta previa in multiparae with cervix dilated or dilatable; and, a moderately contracted pelvis, when the child is small.

[The Editor would not be satisfied with 8 per cent. mortality in his deliveries. Dr. Potter must advance better arguments than this if we are to follow all he advocates for the operation of version.—ED.]

Differentiation of High From Median Forceps Application. The term "high forceps" is applicable alone to instances where the fetal head is floating above the brim. "Median forceps" where the head has engaged or has entered the superior strait. In the first instance under normal pelvic capacity an alternate operation offers, *i. e.*, version; in the second, failing delivery by forceps, the alternate operation is the Cesarean, for modern obstetrics frowns on perforation and cranioclasty of the living child, irrespective of religious belief. [Sad to say, this is not an attainable ideal.—ED.] These are the views formulated by E. H. Grandin⁴ as he reviews his experience in over 6,000 labors as a student in Europe and as a practitioner at the N. Y. Maternity and the Infant Asylum.

His views are not shared by many teachers of far greater repute, but each man at last formulates opinions which serve as his compass. High forceps, *i. e.*, today, forceps applied to the floating head, must be looked upon as the most major of all the obstetric operations and such practice can alone be defended on ignorance of a very culpable, well-nigh actionable nature. In his estimate of the place in obstetrics occupied by the high and medium forceps, version and the Cesarean section, Grandin purposely disards symphysiotomy and pubiotomy, the former after lying dead for many year was resurrected only to be buried again by unanimous consent. Pubiotomy is unsurgical in principle and damnable in practice. [?—ED.]

One of the curiosities of obstetric practice is the fact that after nearly 40 years, the profession almost as a

unit is ignorant of the value in cases of high application of the axis traction forceps. As a student under Tarnier in Paris, Grandin became convinced in 1879 that the man who would practise obstetrics well must be the owner of the instrument. And yet not many years ago he could count on the fingers of one hand the men who possessed the instrument and knew how and when to use it. He has for years entered a plea for the instrument and once more asks the profession to study its applicability. The instrument is cumbersome and costly, but these are not valid reasons for not owning it. Applied *lege artis* to the head just engaged, followed by intermittent traction, allowing the head to mould slowly—and, by the way, attempts at forcible moulding are criminal—it will save many an infant otherwise doomed and will render unnecessary resort to many a Cesarean section. Such, at least, is the mature opinion of the older teachers of the obstetric art.

[It is true that craniotomy on the living child is an abhorrent, repulsive operation, and has been banished from the practice of good obstetricians. But, and we suffer pain as we write it, the necessity for sacrificing the child to save the mother still arises once in a while. True, the cases are getting rarer every year, certainly in the cities, but when a parturient has been neglected, infected and the child dying from injury and asphyxia, he would be a cowardly man indeed who would shrink from an evidently humane duty. Therefore let us not condemn too harshly the practitioner, far from expert help and in an unfavorable environment, if he thus saves one from a peril that threatens two. On the other hand, the man who, in opposite circumstances, lets the favorable time for Cesarean section or pubiotomy slip by, or who ignorantly botches a case, he is deserving of censure. The newer methods of Cesarean section will enable us to save many of the babies threatened in these straits.
—ED.]

"The Lost Art of Obstetrics." Obstetrics in its highest conception is not an exact science, but more nearly so than any other department of medicine, and Palmer Findley⁵ confesses a feeling of chagrin at the manifold

abuses that have crept in which would never exist were it not for want of training and the temptation of notoriety from a spectacular operation. Almost all students aspire to be surgeons and the few who eventually take up midwifery do so largely because of a chance opportunity. Unfortunately obstetrics does not receive reward proportionate to responsibilities and as a natural sequence there is a disposition on the part of the profession to neglect it.

Belly-ripping has become a mania and threatens to supplant many altogether reliable manual means of delivery through the natural passages. He has sometimes suspected that the surgeon views these passages as a makeshift to be used when the surgeon is otherwise engaged.

Cesarean section was primarily employed in contracted pelvis of not more than 6.5 cm. Today almost any degree of contraction will suffice for an indication. If we were to tabulate the indications we would find in this list pelvic measurements as high as 9 cm., placenta previa, eclampsia and other toxemias; breech, face, brow and transverse presentations and, finally, we learn from our Boston friends that the pampered society woman should be spared the exhaustive results of labor upon her nervous mechanism by resort to section.

All agree that in contracted pelvis of 7.5 cm. or under, elective section is the choice. But it must be done before the patient has reached the stage of exhaustion, and before evidence or suspicion of infection. In exhaustion or infection, the conservative operation must be set aside for the Porro-Cesarean or for some means of delivery of the child through the natural passages, even if such delivery involve the sacrifice of the child. With every added hour of the 2d stage, the risk is increased and, all other things being equal, the conservative operation at the onset of labor, with a legitimate maternal mortality of not more than 2 per cent., becomes most hazardous in exhaustion with a possible mortality of 10 per cent.

Cesarean section can be done by an operator of mediocre ability, but to have a comprehensive understanding of the indications for it implies a knowledge of

obstetrics which relatively few possess in this land of ours.

What of the moderately contracted pelvis of 8 to 9.5 cm.? Are we to apply the test of labor and failing in this do a Cesarean? If we give them the test of labor over a period of several hours in the 2d stage, we have brought them to the stage of exhaustion and the hazards are increased with every hour. Four out of every 5 of such cases will deliver themselves and only require watchful waiting on the part of the accoucheur. If a disproportion between the head and the pelvis exists, the cervix is unyielding and contractions ineffectual, there is argument in favor of a conservative section, if done in the absence of infection and before the stage of exhaustion. Give the woman time, fortify yourself against the temptation to save yourself time and thereby gain the applause of the community by the doing of a wonderful operation, and most of these women will be delivered spontaneously or, at most, by the aid of forceps or version. Pubiotomy is useful where the test of labor has been applied without results and will find a more favorable reception when it becomes better understood.

Of late we have heard much of section for placenta previa. Findley would heartily endorse the operation in a central implantation in a primipara, where version is always attended with grave danger. But in all others and particularly multiparæ the hydrostatic bag, followed by version and extraction, will save more mothers with but a slightly higher fetal mortality. These babies are often dead or seriously affected by the loss of blood and we are not justified in adding extra hazard to the mother in the interest of a child of doubtful existence.

Eclampsia is yet another of the furors of obstetrics which has been assigned to the abdominal surgeon. In these cases labor usually progresses rapidly, at best the life of the child is imperiled from prematurity, toxemia and the forceful contractions. Moreover an eclamptic individual is a poor subject for operation, just as is any other toxic individual. Does it not seem that most American obstetricians are wise in choosing the middle ground between early radical intervention, as practised in London, and the long delay advocated by Stroganoff?

In an old primipara with a rigid cervix and a viable fetus section, under favorable conditions, is justifiable, but in the absence of a contracted pelvis or an obstructing tumor there is no justification for it on a multiparous eclamptic. There is, however, a very useful procedure for eclamptic cases with delayed dilatation; *i. e.*, vaginal hysterotomy which may very properly supplant the more tedious and, at times, impossible manual dilatation.

In a neglected transverse presentation, with the shoulder so impacted that version is impossible without grave danger of rupture and serious injury to the child, section may be considered, bearing in mind that the mother is usually exhausted and probably infected from repeated attempts at delivery. The choice must be for a Porro-Cesarean or for decapitation and extraction. Where the desire for a living child is great a section followed by removal of the uterus may be chosen. In breech and face presentations, in the absence of a marked pelvic contraction, section finds no place, with the possible exception of an old primipara with a rigid cervix.

Many able obstetricians subscribe to the dictum "once a Cesarean section, always a Cesarean section." Findley recently compiled all reported cases of section at his command which had subsequently become pregnant and found that in 2 per cent. the uterus ruptured through the scar. We are not justified in adopting the dictum, but all such cases should be delivered in a hospital with every facility in event of an impending rupture. Since we have no means of estimating the resisting quality of a uterine scar, therefore, such procedures as pituitrin, application of high forceps, version and the introduction of a bag should be avoided.

[There is no question but that the abdominal delivery is being performed when other methods would be successful. This is because of the ease and safety of section and ignorance of true obstetric art. The Editor is performing section much more often than in former years, because it is becoming increasingly safe, and it is such an example that is followed by men of less experience,

and leads to disaster so often because they do not know how to select the cases for section.

Recently several women have asked me to do Cesarean section instead of permitting natural delivery—they had heard it was easier, less painful, and no more dangerous than natural delivery! One woman quoted a physician as saying it was “the method of birth of the future!” The Editor has now had over 110 consecutive cases without a death from the operation, and selects this mode of delivery often in preference to the brutal forceps operations of the past.—ED.]

The Technique of Cesarean Sections. This operation is comparatively frequent at Rochdale Infirmary on account of pelvic contractions, and these in turn due to the worst form of rickets. Describing the technique, J. C. Jefferson⁶ says he has come to look upon patients who are to be subjected to this operation as falling into one of two groups:—(1) Those with no previous intervention with a view to effecting delivery; *i. e.*, those who on account of their past obstetric history, the defects revealed by pelvimetry, or both, are deliberately subjected to the operation, either at the end of pregnancy or in the earliest stage of labor. (2) Those in whom previous attempts to deliver have been made. All cases in the latter group he considers to be probably infected, and the technique is varied accordingly.

(1) The operation area is covered with two complete layers of sterile batiste, towels, and sheets. Immediately the abdominal incision is completed and the peritoneum opened, thick Turkish towelling is clamped to its edges with forceps. To promote subsequent contraction, 1 c.c. of pituitary extract is given hypodermically. The uterus is incised and its contents rapidly extracted. The organ is then lifted out and grasped firmly around its base by an assistant, while the interior is carefully wiped with dry gauze to remove any shreds of placenta or membranes. Particular attention is paid to the area just above the internal os.

Next comes an essential step—stretching the cervical canal to provide a free outflow for the lochia. Thrust-

ing two fingers of left hand down the canal until their tips have passed through external os into vagina. They are now separated to stretch the os, and rapidly withdrawn. Great care is taken, in withdrawing them, that they come in contact as little as possible with the internal surface of the uterus, and not at all with the edges of its wound or the towels. The gloves are then immediately taken off, hands re-sterilized, and fresh gloves put on. The uterine incision is now closed with interrupted catgut and the organ dropped back. Next, the upper layer of towels and batiste is removed, leaving exposed the clean, lower layer. The peritoneal cavity is then swabbed out, omentum drawn down in front of the uterus, and abdominal incision closed.

(2) A douche is given immediately before the patient enters the theatre. The arrangement of the towels is the same, but the abdominal incision is made considerably longer so the uterus can at once be lifted out. The intestines are now packed off with gauze, and the edges of the aperture in the upper abdominal sheet are drawn tightly around the lower uterine segment and pinned to it with towel clips. The 1 c.c. of pituitary extract is given as before, the uterus incised and emptied. The membranes are cleared in the usual way, and the interior of uterus well swabbed with iodine, the cut edges of the uterine wall receiving the like attention. The gloves are changed as before, the uterine incision closed, and the upper layer of towels removed. The gloves are then changed for the second time. The uterus, meanwhile, has been dropped back into the abdominal cavity, which is next thoroughly swabbed out. The omentum is drawn down behind the uterus, so in event of leakage of infected uterine contents taking place, or suppuration occurring in the uterine incision, the intestines will, in some measure be protected. The edges of the abdominal incision are swabbed with iodine, and the wound closed.

Improved Cesarean Section. The technique which takes only 2 or 3 minutes, and on one occasion less than a minute, is described by A. L. Smith.⁷ This quickness has many and manifest advantages. First, there is no need to put clamps on the few little bleeding vessels in

the abdominal incision. Consequently, after a one-inch incision of skin, the knife is laid down and the scissors bent on the edge complete the opening with little or no hemorrhage. In the same way, the abdominal fascia and peritoneum are pinched up and cut through, and in some cases the incision can be extended up and down simply by pulling the two index fingers firmly apart. Then a nick is made with scissors in the midline of the anterior uterine wall, two fingers again enlarge this up and down without cutting any arteries of consequence, and the right hand is rapidly slipped in between the placenta and the abdominal [? uterine] wall, a foot seized, and the whole ovum extracted. In placenta previa, the placenta is elsewhere and is not concerned in the incision nor even seen until the child has been extracted. In all his cases the placenta came off without the slightest difficulty, and from that moment the hemorrhage, if there had been any (and there was almost none), had stopped.

He begins the incision just below the umbilicus, and extends it up, with finger in the abdominal cavity, to $1\frac{1}{2}$ or 2 inches above the navel, and down, watching carefully all the time that the bladder is nowhere near, until the incision is $7\frac{1}{2}$ inches long.

The moment the child is out, there is no difficulty whatever in lifting the uterus out and completing the operation, while it is surrounded by sterilized towels, so not a drop of blood can get into the abdominal cavity. Then take a medium-size curved needle, with a good holder, and having pulled the peritoneum, which is very lightly attached to the uterus, back $\frac{1}{4}$ of an inch from the edge of the incision, pass the stitches by going in only a little way back from the edge of the incision, making a fairly large sweep so as to get a good hold of the muscular wall, but not going down as far as the mucosa. Enter the other side exactly opposite, and bring the needle out again $\frac{1}{4}$ inch from the edge, but under the peritoneum. If interrupted sutures are used there these stitches are all put in first, before tying any of them, and then the assistant picks them all up in a bunch and hands them one by one to be gently but firmly tied up, thus bringing the separated surfaces

closely together. When these stitches have all been tied up, the peritoneum is brought over them by fine chromic gut or fine Chinese silk, and by doing an over-and-over stitch, like the sewing of a glove, the slightest oozing, if there was any, from the stitch holes in the uterine tissue, will immediately be stopped by the pressure which the drawing together with the peritoneum exerts; so there is a great advantage in closing the peritoneum, not by interrupted stitches and not with the stitches that were used for sewing the muscle. In 2 cases Smith used a running catgut suture for uniting the muscle which is much quicker and heals, apparently, equally well.

In closing the abdominal wall, it is equally important to bring the peritoneum together with a running stitch of fine gut which will last 3 or 4 days or more. The muscular layer can very quickly be sewn up with slightly larger catgut, but not too coarse, which will last 10 days. For the skin interrupted sutures of silk-worm-gut, left in about 2 weeks.

[The Editor has delivered a large child within 40 seconds, but such haste is neither necessary nor advisable. The knife or scissors makes a better opening into the uterus than tearing the muscle—the edges come together better for suture. VanHook recommended the tearing to me 22 years ago and I tried it several times.—ED.]

Simple Method for Extraperitoneal Cesarean Section. The procedure is very similar to the Hirst method without a few of its technical difficulties, and its sponsor, T. H. Cherry,⁸ describes it as follows: Incision in mid-line from symphysis to umbilicus through skin, fat and fascia of recti. The muscles are separated by blunt dissection exposing the transversalis fascia and peritoneum. At this stage the edges of the muscle are bluntly dissected off the peritoneum for a short distance until the deep epigastric vessels are seen, which allows for freer play of the peritoneum. The latter is opened vertically, and the cut edges of the parietal portion are then sutured to the visceral peritoneum in such a manner that an oval area about 5 inches long and 3 1/2 wide in the lower uterine segment is left exposed, care being taken to interrupt and tie this continuous suture

at several points to prevent it acting as a pursestring. This shuts out the general peritoneal cavity. The thin lower uterine segment is then incised in midline for 4 1/2 inches, the blades of the forceps are introduced to the sides of the head, and child extracted. The placenta and membranes are then delivered. One c.c. of pituitrin is given intramuscularly at this stage followed immediately by 30 minims of ergotol. The uterine wound is then closed by interrupted chromic gut sutures; a continuous seromuscular suture is made over this line and the sutured edges of parietal and visceral peritoneum are sutured together. The rest of the wound is closed as usual without drainage. As regards the results following such a procedure, it can be assumed that the maternal mortality is the same as for other transperitoneal methods adopted in contaminated cases. Concerning the possibility of the sutured peritoneal surfaces acting as a suspensory ligament from the lower abdominal wall to the lower uterine segment, and theoretically at least producing a backward displacement of the fundus, the same principle is involved in the Hirst technic—and he reports no such complication in his 31 cases.

Abdominal Cesarean Section. Eleven operations have been performed by J. R. Young.¹ Five were done in eclampsia or toxemia. One died in coma on 3d day, 4 recovered. Two cases for contracted pelvis; 1 for placenta previa; 1 for premature separation of placenta, and 1 for firm stenosis of cervix, (on primipara of 43 who had been given three days' test of labor) recovered. Also 1 for dystocia following ventrofixation.

In addition, Young collected 80 cases done by 12 operators in his state (S. Car.) with maternal mortality of 16 and fetal mortality of 23 per cent.; and excluding children who were dead before operating, or were premature, the fetal mortality was only 2.7 per cent. These figures do not compare unfavorably with those of A. B. Davis, who in his 500 cases had a maternal mortality of 10 per cent.; and in his series the indication of contracted pelvis was relatively much more common. In the 80 cases there were 42 eclampsias with

(1) Virginia Med. Semi-Month., Aug. 24, 1917.

maternal mortality of 23 and fetal 33 per cent. Excluding premature infants and those dead before operation fetal mortality was nil. Davis' mortality in eclampsia was 37 per cent.

Young believes abdominal section has an established place in surgical obstetrics. Where absolutely indicated for mechanical reasons it should be early and patient not subjected to test of labor.

Its success will vary inversely with chance of previous infection.

Eclampsia is not itself an indication, but an obstetric condition which precludes rapid and safe delivery through the natural passage is an indication for section in eclampsia. It is preeminently important that Cesarean section, when indicated, be done early in eclampsia before the narrow margin of safety is effaced by repeated infection-inviting examinations and attempts at delivery. When the uterus has been thus emptied the treatment is not complete. Only the "toxogenetic" focus has been removed and the further elaboration of the eclampsia producing poison stopped. The patient will recover or succumb according to whether or not she is already hopelessly saturated with the kidney and liver-necrosing poisons.

Placenta previa and premature separation of normally situated placenta do not demand section if the soft parts are prepared for rapid natural delivery. In short, any obstetric condition that may confront us whether it be a problem in mechanics, as an impacted shoulder presentation, or urgent pathology, as toxemia; hemorrhage, or poorly compensating heart lesion, should be indications for section if it appears this operation offers best chance of life to mother and child.

Plea for Cesarean Section in Selected Cases—34 Consecutive Cases Without Mortality. G. P. Coopernail² performed 34 Cesarean sections without maternal or fetal mortality; 2 were for eclampsia, 1 placenta previa, 1 fibroids; the rest, contracted pelvis. Three babies were hard to revive because morphine had been given within 2 hours.

Cesarean Reviewed. In his review, J. L. Riggles³ quotes Newell's figures (Obstetrics volume, 1917, p. 153). The records of the Washington hospitals are: Columbia Hospital, from July 1, 1915, to June 30, 1917, 36 abdominal Cesareans with 2 deaths. In two years, George Washington had 6 Cesareans with 2 deaths; Georgetown Hospital, 14 abdominal with one death. Sibley, 1916-7, 37 hysterotomies with 2 deaths. Garfield Hospital had 4 Cesareans in two years, with no deaths.

Although the mortality figures show there is a wide range of per cent. of deaths with different operators, many women and infants are saved who would be sacrificed by other means of delivery.

Riggles discredits the high forceps operation, forcible divulsion of the cervix to accomplish version in eclampsia, temporizing with placenta previa, craniotomy in the living child, pubiotomy or symphysiotomy, ultra-conservatism in primiparae when the head will not engage and cannot be pushed into the pelvis after 20 hours of labor, and measurements lower than 18 ctm. extra conjugate, also the use of pituitrin until after the placenta has passed the cervix, and above all scopolamine which has no place in complicated obstetrics.

His opinion is based on a series of 12 personal cases, all the children lived, and 10 mothers. [109 cases—9 deaths.—ED.]

Cesarean Section in Primipara, Followed by Normal Delivery. In a patient, aged 28, F. Warner⁴ performed section Dec. 21, 1914, for placenta previa with rigid and undilated os. March 20, 1916, she gave birth to a full-term child without special incident; the scar having shown no tendency to give way, though her physician watched her very carefully for any signs of it. Warner is informed there was no tendency to its yielding to the strain.

Study of 50 Uteri Removed at Cesarean Section. In 20 years in his service at J. Hopkins Hospital, J. W. Williams⁵ has had occasion to amputate the body of the uterus supravaginally, and treat the stump extraperi-

(3) Virginia Med. Month., April, 1918.

(4) Amer. Jour. Obstet., October, 1917.

(5) Bull. J. Hopkins Hospital, November, 1917.

toneally in 50 cases following delivery by Cesarean sections. In 37 instances the indications were:

	Cases.
Repeated Cesarean sections	10
Frank infection.....	8
Rupture of uterus.....	5
Serious heart lesions.....	4
Atresia of cervix.....	3
Intramuscular hemorrhage with premature separation of placenta.....	2
Myoma of the uterus.....	2
Atonic hemorrhage	2
Pregnancy in a rudimentary horn.....	1

In 13 cases it was undertaken for various other indications. Supravaginal amputation may have been unnecessary in a small number of the latter group of cases, but for the great majority it was fully justifiable.

Location of placenta. This was attached to the anterior wall in 18 and to the posterior in 32 instances. In 15 specimens, the placenta remained firmly attached after completion of the operation, while in the other 35 it had either separated spontaneously or had been removed manually before amputation. In the cases of retention, the placenta was attached to the anterior wall in 3 and to the posterior in 12 instances. The lesser incidence of the anterior attachment is probably attributable to the fact it was necessary to incise or to separate the placenta manually before delivering child.

Mechanism of separation of placenta. While prepared to admit, at least in part, the claim that incision and manipulation of the uterus introduce a disturbing factor into the physiology of the 3d stage of labor, Williams nevertheless feels that these specimens—particularly those with placenta *in situ*—give important clews concerning the mechanism of separation. (*A*) They clearly demonstrate the diminution in the area of the placental site, and show the placenta, to accommodate itself to the process, has increased markedly in thickness. (*B*) That in nearly one-third the placenta was still *in situ* and showed no sign of separation or of hemorrhage beneath it, during the 10 or 15 minutes between the delivery and the amputation, clearly dem-

onstrates that retroplacental hemorrhage does not always appear promptly, and to some extent justifies the assumption it is not usually the primary factor concerned, but develops secondarily after some other mechanism has inaugurated the separation. (C) The festooning of the fetal membranes and the decidua gives conclusive information concerning the mechanism of their separation; it is apparent the way has been prepared for their detachment by traction or gravity as soon as the placenta has become loosened and begins to descend.

On the other hand, the specimens give no information concerning the immediate cause of separation, and force us to take refuge in hypotheses if we wish to attempt to explain the entire mechanism.

Location of Separation. In some cases cleavage occurs definitely in the spongy layer, less frequently in the compact layer, but very often it is irregular. Consequently, the amount of decidua retained may vary greatly, and all gradations may be observed from a thick layer to minute decidual triangles between the serrated margin of the muscularis.

Placental Site. In not a few specimens the placental site could only be established after microscopic study. Neither the amount of decidual tissue retained nor the increased vascularity enables one to make a decision, which depends almost entirely upon the fetal-cell infiltration or of certain vascular changes, which only occur in this locality.

Muscular Retraction. In the full-term pregnant uterus there is excessive thinness of its muscular walls, and their fibers have lost the felt-like structure characteristic of early pregnancy and become arranged in almost parallel strands. Coincidently with the emptying of the uterus and the great increase in the thickness of its walls, the arrangement of the fibers undergoes immediate change, and microscopic examination shows the individual cells have become considerably shorter and thicker. The muscle bundles have lost their more or less parallel arrangement and now pursue an irregular and complicated course. This change, of course, is incident to the contraction and retraction of the organ, and was clearly noted in 42 specimens.

Inflammation of the Decidua. In 8 instances the indication for removal of the uterus consisted in frank intra-partum infection. In all of these cases, microscopic examination revealed the existence of acute inflammatory changes in the decidua. The process was most intense in the lower segment, thus indicating that the infection had ascended. In a number the placental site was involved, probably a considerable number of the women would have presented severe, if not fatal, infection in the puerperium had the uterus not been removed, and thus additional evidence is afforded of the wisdom of a radical course.

In addition to these 8 cases, definite inflammatory changes were noted in 12 others. All from patients who had been examined by outside physicians before admission, or in whom for one reason or another intervention had been deferred until late in labor. In a number of these specimens streptococci could be demonstrated, but in others, such evidence could not be adduced.

That inflammatory changes were present in 40 per cent. of the specimens serves to demonstrate anew the dangers of conservative Cesarean section when performed at any other than the optimal time—at an appointed date during the last days of pregnancy or within a few hours after the onset of labor in patients who have recently been examined only by those who observe an appropriate technique. In this group of cases, at least, the disadvantages incident to permanent sterilization have been more than compensated for by the increased saving of maternal life from radical operation.

Behavior of the Cicatrix After Repeated Section. In the series are included 10 uteri which had already been subjected to Cesarean section upon one or more previous occasions. In 8 specimens, one of which had been subjected to two and another to three previous sections, it was difficult to find the old cicatrix by the naked eye, and the only indication was the presence of slight vertical depressions upon the external and internal surfaces of the uterus. In these specimens microscopic examination revealed the entire absence of scar tissue in the wall and showed the muscle fibers extended across the site of the old incision as if it had never existed.

In other words, examination showed that the uterine wall had been restored to its integrity, and that it offered little more chance for rupture than had a previous operation not been performed. The behavior of the cicatrix can be regarded with equanimity provided the previous convalescence has been normal, but when it has been disturbed there is a reasonable probability of the occurrence of rupture, and such patients should be kept under the closest observation during the last months of a succeeding pregnancy.

[Williams' paper explains why there is a high mortality in Cesarean section when done with improper indication. The Editor believes that the new cervical methods of section would have obviated the necessity of extirpating the uterus in a few of the 42 cases.—Ed.]

Cesarean Section Scars. This histologic study by A. B. Spalding⁶ is based on 4 specimens from the Stanford University Clinic, where 18 sections have been done in the last 2,060 consecutive confinements. It seems to him justifiable to conclude that more than 10 per cent. of such scars are defective. The chief cause for the defect seems to lie in imperfect healing of the endometrium. In case the incision is into the placental site, there may be imperfect healing due to the degeneration of decidua serotina, or the scar may be weakened by the inclusion of decidual tissue in the muscle wall. There is not much evidence to uphold the view that the syncytium attacks the well healed scar, although 2 such cases have been reported.

The placenta is frequently found overlying the weakened scar in cases of rupture. This may produce rupture from retroplacental hemorrhage, or may act as a splint to support the weakened scar.

Of 75 reported cases, all but one were ruptures in the upper part of the uterus. From this it seems that the extraperitoneal section carries with it a better prognosis than the classic abdominal operation.

Rupture of the uterus is probably produced by the increased intra-uterine pressure forcing a water wedge into the defective scar.

Although well-healed scars can withstand the strain

of future labors, the frequency of rupture after section is so much greater than rupture from other causes that the indications for section should not include such patients as can just as well be treated by the induction of labor at term, pubiotomy, vaginal hysterotomy, or other well known operations.

[Cherry's is the only report of the low, cervical supra-symphysial trans- and extra-peritoneal Cesarean section. Yet the Editor is well convinced that they have a real place in our obstetric armamentarium. True, they are technically more difficult—but this is an advantage. They will not be abused. In previous Year Books these operations have been described and illustrated. They should be used more.—ED.]

Injuries Accompanying Labor. Three types of these are considered by A. J. Skeel:⁷

1. *Repair of Perineal Injuries.* The classic method of primary repair is certainly responsible for innumerable failures. Cut or torn muscles retract promptly and vigorously. What surgeon would repair a transverse incision through the muscle of the forearm by thrusting a large curved needle into the skin on one side, making a wide sweep to try to include the muscle ends, and then bring his needle out after a similar wide sweep on the opposite side? No wonder the woman has to have a secondary repair. The retracted muscles have not been and cannot be properly brought together by this method unless the injury is very slight. Fear of the buried suture dictated the usual method. Poor aseptic technique, common in obstetrics 25 years ago, is responsible for this fear. Any accoucheur who has at his command a safe aseptic technique need not fear to bury catgut in the perineum.

For several years Skeel has been doing primary perineal repairs exactly as in the split flap secondary repair, *i. e.*: The torn muscles and fascia are picked up with a short curved needle, using No. 2 chromic gut; the parts are brought snugly together. The mucosa and skin are then sewed up, burying the deeper layer of sutures, being careful to avoid tension. If the injury is rather extensive the danger of premature softening

and absorption of the catgut is safeguarded against by insertion of one or two silkworm stay sutures after the parts have been brought together. Infection and sloughing do not occur as frequently as by the older method, probably because there is less danger of over-tension.

2. *Cervical Repair.* Cervical inspection may be done with or without analgesia. When using gas for the labor, he usually has analgesia for the inspection. If dependent upon ether, frequently no analgesia is used. It is quite possible to inspect the cervix satisfactorily before delivery of the placenta. In fact, sometimes the presence of the placenta facilitates inspection.

Exactly as in secondary repair, the point of greatest importance is to get the upper angle well united. One is dealing with the large post-partum uterus; this is about to undergo involution, transforming it again from an organ weighing 2 pounds to one weighing only a few ounces; consequently all parts are trebled or quadrupled in size; a half-inch tear is negligible and should not be sutured. No attempt is made to suture the lowermost point of the tear. Sewing the cervix too tight could only result from very clumsy technique. With proper exposure, the limits of the tear are perfectly definite and it is only necessary to reunite the separated parts.

The cervix is exposed by fairly large vaginal retractors; when short of help, use a weighted retractor. The fundus is pushed somewhat down by an assistant, the cervix grasped with sponge-holders, and rapidly inspected. Injuries are almost always at the right or left angle. The anterior and posterior lips are not torn except under very unusual circumstances. If everything is O. K., the whole process takes but a few moments. The perineum is covered with a rubber or towel protector folded over adhesive and fastened to thighs.

Immediate cervical inspection and repair would probably better not be undertaken except in a good hospital. Multiparæ with old lacerations are never inspected, nor in the presence of known gonorrhœal or other infection.

After a little experience it is surprising how accurately one can predict the presence or absence of serious laceration. In 200 cases, 100 inspections were made and 31 primary repairs done. Satisfactory union oc-

curred in all but 5. There was only one infection, a phlebitis in a patient after manual flexion of the head, forceps and manual extraction of placenta.

3. *Uterine Supports.* During pregnancy the round and broad ligaments, etc., undergo hypertrophy and, of course, are greatly lengthened. During the 2d stage, these structures, with the other pelvic attachments of the uterus, are subject to severe tension. Whatever force the uterus exerts as expulsive pressure upon the child is possible only because of the exactly equal counter-restraining pull of these structures. They are, therefore, liable to over-stretching in a hard labor, which frequently results in loss of tone. Late post-partum examinations reveal a surprising number of retroversions. Relaxed round, broad, and utero-sacral ligaments certainly contribute their share in permitting this.

By way of prophylaxis Skeel is trying to avoid over-strenuous straining, as well as counter-pressure over the fundus during the severe 2d stage pains. Free motion in bed is allowed early. After a few days, or as soon as the fundus has reached the promontory, an attempt is made to prevent its dropping into the sacral excavation by urging the woman to lie frequently on her abdomen.

Twelve to fourteen days post-partum examination is made and four points recorded—condition of the vaginal outlet; of the cervix; position of uterus; involution and consistency of uterus. If retroverted, the knee-chest posture is promptly instituted. The woman is instructed how properly to take the position. Particular attention is paid to allowing the vagina to distend with air. After two weeks she is again examined, and if postural treatment has been unsuccessful, the uterus is replaced and an Albert Smith pessary introduced.

These measures usually fail to cure cases in which retroversion was present previous to or early in pregnancy. However, the ones which have developed solely as the result of pregnancy and labor are frequently quite successful. Our knowledge of the causes of retroversion following labor is too limited and our methods of prevention too frequently fail to prevent. Intervention is often necessary to restore normal conditions.

It does seem that as a whole the profession is too complacent in the presence of these unsatisfactory results. These problems are worthy of the best thought and skill at our command. The ill-results of pregnancy and labor present a major problem. Whatever improvement Skeel has succeeded in getting has been due entirely to careful and repeated post-partum examinations, with systematic recording of results.

Immediate Repair of Cervix. During the past year at Mt. Sinai Hospital (Cleveland) they have sutured the torn cervix before repairing the lacerated perineum. Thus far the results have been uniformly satisfactory and successful. The technique as described by J. L. Bubis⁸ is the following:

Patient in exaggerated lithotomy position, using the Robb leg holder to flex the thighs, and the Hirst separator to keep knees apart. A good light and one or two competent assistants are indispensable. The cervix is then grasped by one or more tenacula, ring-shaped and covered with rubber, so as to cause the least amount of damage. It is easier to inspect and grasp the torn cervix before the expulsion of placenta. After delivery of placenta, the uterus is massaged until it is firmly contracted and uterine hemorrhage has ceased. If necessary, the patient may be given 1 c.c. of pituitrin or ergotol. After carefully cleansing the vagina, a weighted perineal retractor is placed to depress the posterior vaginal wall. The cervix is then pulled down as far as possible and again inspected. The tenacula are readjusted and cervix pulled in the direction opposite to laceration. A flexible retractor is so placed by an assistant as to expose the tear. Enough sutures of interrupted chromic gut No. 2 are inserted to insure complete hemostasis and good coaptation. In tying the knot, allowance must be made for shrinkage of the tissues. Care must also be taken to insure good drainage and to leave the cervical canal patulous. The line of suture is then swabbed with a 2-per cent. iodine solution. All other lacerations are treated in the same way. No vaginal drains or packing are used except where there is danger of an adhesion between the cervix and the lateral wall.

To avoid this a strip of weak iodoform gauze (removed within 48 hours) is placed along the line of suture and extended to the vulva. The perineum is then inspected and repaired, if necessary.

The uterus is kept firmly contracted to avoid any hemorrhage or the formation and retention of clots within the cavity and to keep an even tension on the cervical sutures.

The Immediate Operation for Perineal Lacerations. Very few authors advise any exact procedure; nearly all consider that a few sutures more or less deeply placed from the outer side, so as to include as much as possible of the torn tissues, are sufficient. This can not yield a satisfactory result. The torn ends of muscles may be overlapped and are more often not caught up at all, thus leaving a space beneath the surface due to muscular contraction and deficiency, which weakens the natural support and encourages prolapse of other organs.

The technique advised by H. A. Bernstein⁹ is as follows: The mucocutaneous edge of the wound at each side of the tear, where it enters the vagina, is caught up with a guide and traction suture. The operator or assistant, with regulated tension on these sutures, holds the wound open for inspection. The labia are widely separated, the wound is cleansed, bleeding points controlled, and torn edges of the muscles, which are generally represented by depressions in the side walls of wound, brought out with tenacula or temporary sutures, and joined with chromic gut, and the number of interrupted sutures are made according to the requirements of the case. Before the muscles are brought together, the cervix may be exposed for inspection and repair. After the muscles have been replaced, if the wound is deep, slack may be taken up in the connective tissue by one or two buried catgut sutures. With the guide sutures held in position for repair, the edges of the vaginal mucosa are now joined with a continuous chromic gut suture, and the outer side of the perineum repaired with 3 or 4 silkworm-gut sutures deeply and widely inserted.

In complete tears, the rectal mucosa must be approxi-

mated first. The torn ends of the sphincter are then brought out of the wound and firmly secured together, and the operation is completed as above. In complete tears a rectal tube should be inserted about 4 inches into the rectum, and retained there about four days. The bowels should not be moved during this time, and all discharges escaping through the tube carefully kept away from the wound, and the perineum be disturbed as little as is compatible with careful cleanliness.

With the exception of 3d degree lacerations, Bernstein has seldom found an anesthetic necessary, though it is perfectly permissible, especially if the patient is hard to control. In closing he again emphasizes the use of the guide or traction sutures, which control the success of the operation (Plates XIII-XIV).

[The Editor has not enough space in this book to say what he has to say in regard to repair of obstetric injuries.

Primary cervical repair he has been making for 20 years—but only in favorable operative surroundings. The results have been excellent.

Direct suture of the muscles of the torn pelvic floor he has also been doing for over 20 years, and has buried as many as 4 rows of catgut sutures. Only clean cases may be thus sewn. Suspect cases require silkgut—using a figure-of-8 suture to be certain to sew accurately the torn levator ani. Contrary to most of the older authorities, accurate anatomic repair of the torn perineum is possible. Latterly, some of my patients have had trouble in subsequent labors—from the too-thorough repair of the pelvic floor. Perhaps some relaxation of the pelvic floor in multiparæ is “physiologic.”

The Editor does not do repair work in the midpuerperal days—the results of primary suture are so good.]

PART III.

THE PUERPERIUM.

PUERPERAL SEPSIS.

Puerperal Septicemia arises in connection with miscarriage or confinement, and, to a large extent, represents a preventable disease. W. Krusen¹ points out that the condition is analogous to wound infection following operation, and may be prevented by the same asepsis universally employed in surgery. Well-regulated hospitals now have a mortality of less than 0.25 per cent.

In 1913 there were in the U. S. Registration Area 10,010 deaths due to child birth and pregnancy; 4,542 caused by puerperal septicemia. It is safe to assume that for the entire U. S. the mortality was approximately 7,000 from septicemia.

The general opinion of the profession and the laity is that deaths from puerperal septicemia are fast decreasing. On the other hand, many eminent specialists believe that outside of hospitals there has been no great decrease in the totals or the rate. Williams, Webster, De Lee and others feel there has been no great improvement. Unfortunately, available figures on this subject do not permit of intensive study. For the registration area as a whole the death rates show no decrease between 1890-1913. The annual average 1901-5 was 14.2; for 1906-10 it was 15.5.

So far as local conditions are concerned puerperal septicemia shows a steady increase. Each year the figures give us more accurate information of the number of cases and death rates, therefore, a comparison with years gone by is likely to cause greater source of error. On general principles the later data are of more value than those of former years. Local conditions are com-

(1) Amer. Jour. Obstet., October, 1917.

pared for 3 quadrennial periods with rates based on the census returns for 1890, 1900 and 1910.

		—Years—				Rate per 100,000
		1890	1891	1892	1893	Total population.
1st Quadrennial—						
United States	30	28	29	33	120	11.05
Foreign	25	16	14	20	75	6.91
Unknown .....	..	2	..	3	5	0.46
2d Quadrennial	1900	1901	1902	1903		
United States	27	38	27	23	115	8.63
Foreign	23	10	8	17	58	4.35
Unknown .....	..	..	..	..	..	..
3d Quadrennial	1910	1911	1912	1913		
United States	80	87	66	86	319	20.02
Foreign	65	39	23	56	183	11.48
Unknown	1	..	1	..	2	0.126
People of color.....	5	6	5	7	23	1.44

Rates based on average population for quadrennial periods.

As shown in the following table, practically all the mortality is confined to the ages 15 to 49:

Year.	Females.	15-19 Girls.	—Age Groups—			
			20-30	30-40	40-50	50 & over.
1907.....	119	14	54	43	8	.
1908.....	142	18	72	40	12	.
1909.....	122	15	55	43	8	1
1910.....	146	11	65	57	12	1
1911.....	126	9	58	50	9	.
1912.....	90	12	48	25	5	.
1913.....	142	7	69	55	9	2
1914.....	160	9	83	59	9	.
1915.....	123	9	68	39	7	.
1916.....	134	11	62	54	7	.

Why should puerperal sepsis give rise to so large a mortality? First, there is a widespread ignorance of the dangers connected with childbirth, and the need of proper hygiene and the best skill to prevent them. Second, there is great difficulty in obtaining the proper obstetric care.

It is high time that obstetricians teach the *prevention* of puerperal complications. Fatalism has prevailed long enough in the minds of the laity concerning these conditions, and it becomes our function to supplant this idea with the more optimistic ideal of prophylaxis. The husbands must be taught that the outlay for skilled serv-

ice is one of the necessary family expenditures. The physician must be given additional training in the handling of maternity conditions, and, if possible, the remuneration should be such that he will have an incentive to acquire special skill in this branch. Adequate facilities must be provided for unusual or complicated cases of labor in rural communities as well as in cities. In all localities where there is a large percentage of foreign or colored population, more especially, there must be strict supervision of midwives. Municipalities should institute follow-up work, as well as prenatal work, to protect the lives of the mothers and their children.

Polypoid Decidual Endometritis. Discussing this condition, A. J. Nyulasy² states septicemia following parturition, and definitely associated with the interior of the uterus, rarely arises apart from polypoid decidual endometritis, a term first used by Virchow in 1861. Syphilis in many cases plays an important part in the causation, and was responsible in Virchow's case. The essential factors are: (1) A low-grade irritant, and (2) one acting over a long period. It is not improbable that the gonococcus and the pus cocci are causes.

This disease of the decidua may or may not lead to abortion. It commonly affects the placental site, and occurs in two forms: (1) Tough, rounded, polypoid eminences of various sizes; (2) leathery papillomatous outgrowths. There is a marked tendency of the diseased decidua to undergo infection. The disease, a combination of chronic endometritis and metritis, is characterized microscopically as follows: (1) Endarteritis obliterans. (2) Fibrous tissue formation. (3) Very small venous sinuses. (4) Decidual islands or cells over fairly wide areas, separated by fibrous tissue. (5) Small-cell infiltration. (6) New formation of muscular elements projecting as ingrowths into the decidua. (7) Glands are seldom seen.

The symptoms are abortion, adherent placenta, or sepsis after the full term placenta has come away perfectly "clean." In 100 cases, 80 per cent. had adherent placentæ. The treatment is prompt removal of the diseased decidua by the sharpest possible curette. There

PLATE XIII.

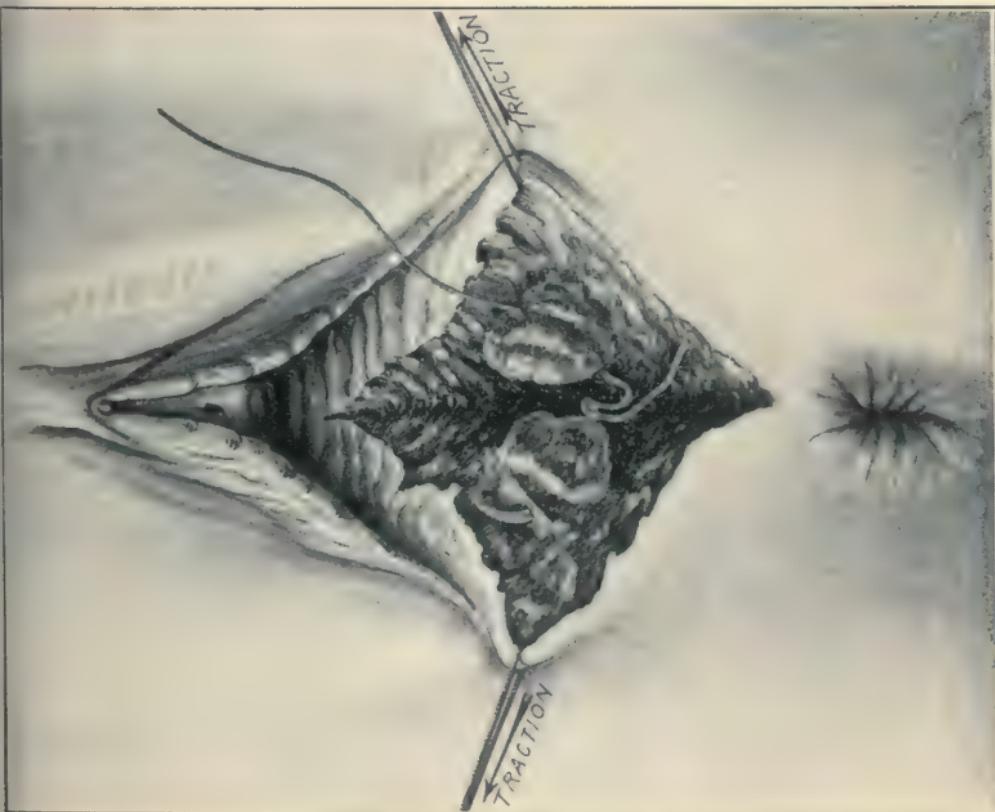
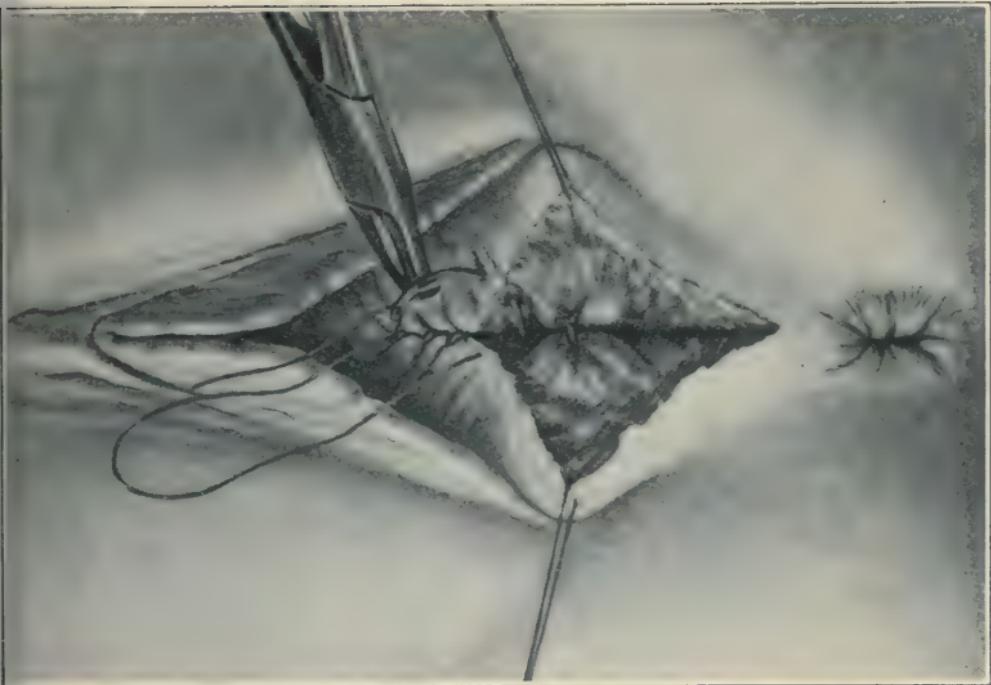
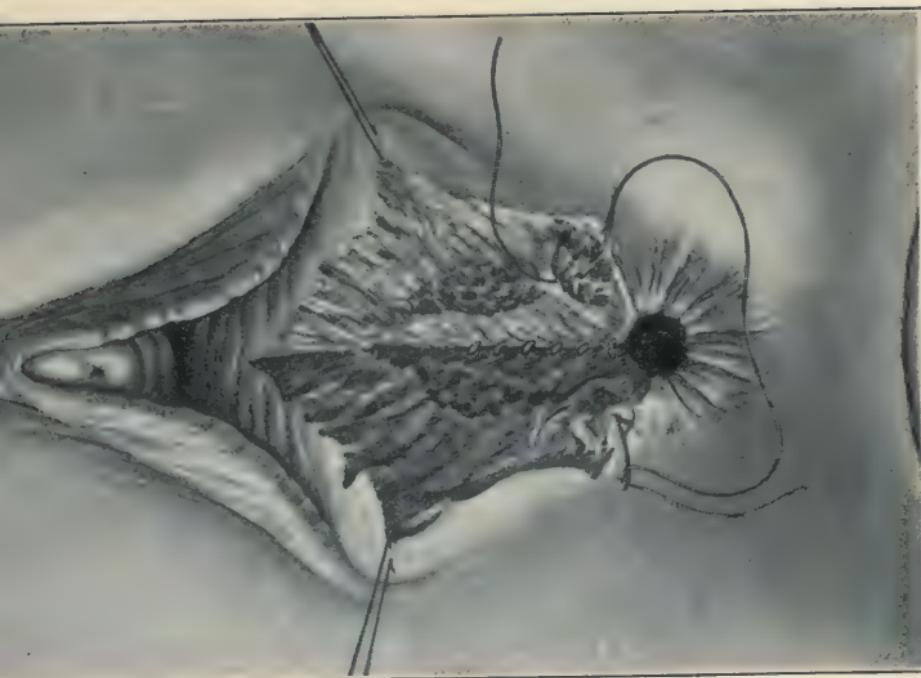
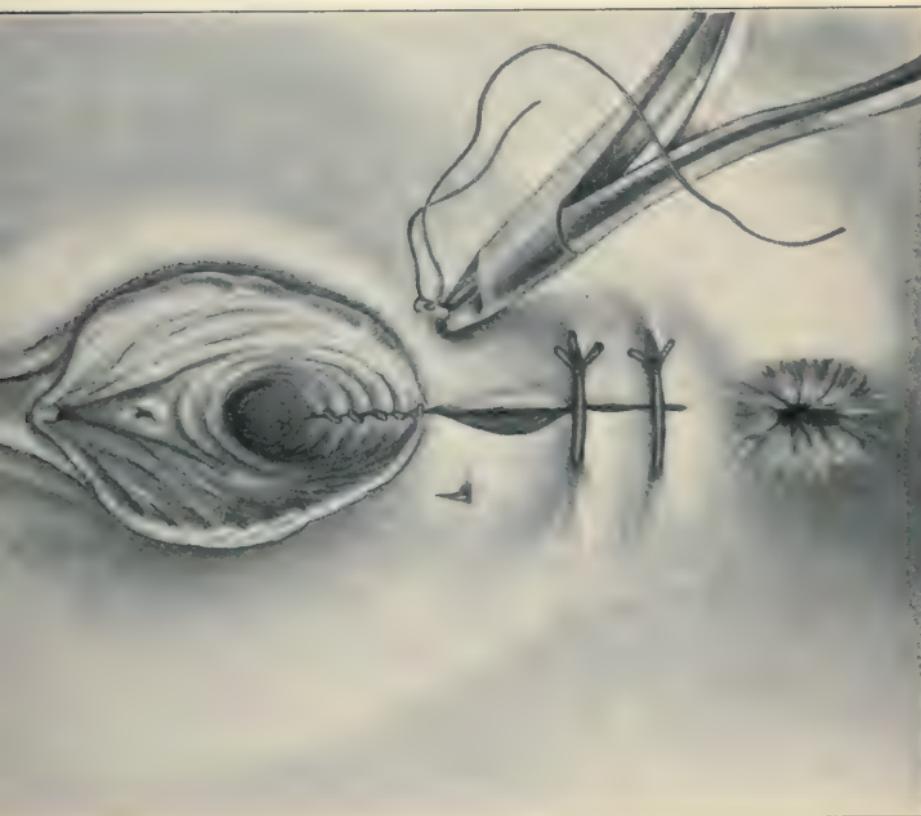


PLATE XIV.



Rectal mucous membrane sutured, and suture inserted into torn edges of sphincter ani.—Bernstein (see p. 288).



Operation completed.

may be severe hemorrhage requiring a pack of iodoform gauze. In skilled hands, this is free from danger. In definite sepsis, the possible risk of further infecting the uterus may fairly be taken. With early removal of the diseased decidua, the maternal mortality and morbidity are practically eliminated.

Escape of Foreign Material Into the Uterine Veins. A study of uteri injected with bismuth through the uterine and ovarian veins shows a rich plexus in the endometrium and also one in the myometrium, consisting of a peripheral and radial plexus. Arcuate veins between the two zones convey the venous blood to the uterine plexus in the broad ligament. Relatively large sinuses (receiving) radiate from the base into the myometrium, and convey the blood from the endometrial plexus into the deeper portion of the radial. If these receiving sinuses are exposed by removing the overlying endometrium, and the uterus is relaxed, thus holding the lumina of the sinuses open, fluid and small solid material could easily escape from the cavity into them and thence into the venous circulation outside the uterus. J. A. Sampson³ believes that uterine contraction following relaxation, when there is obstruction in the cervical canal, and intrauterine irrigation, may bring about increased pressure and force fluid, sterile or containing bacteria in suspension or placental cells, into the venous circulation, and this is one way, and probably a frequent one, by which puerperal infection arises and placental cells reach the lungs.

Treatment of Infection Following Labor. P. B. Bland⁴ prefaches his remarks with the statement that from the Census figures, one is justified in believing that at least 15,000 women die from childbirth in this country every year. Add to this the number who die indirectly from complicating conditions of labor and De Lee feels that no exception can be made to his statement that "the puerperal mortality will reach annually 20,000." De Lee says "one of the striking facts of the modern hospital treatment of parturient women is the high percentage of patients who have moderate degrees of tem-

(3) Jour. Amer. Med. Ass'n., June 15, 1918.
(4) Pennsylvania Med. Jour., October, 1917.

perature during the lying-in period." The report of the Census for 1914 showed that 4,664 women died of puerperal infection and De Lee states again that it is impossible to guess how many women actually suffer from infection and still carry relics of the disease. He figures that if one estimates the mortality of all cases of puerperal infection as 5 per cent. it would mean that in 1914 there were 100,000 infected puerpera in the U. S. Is there a doctor in practice today who has not heard the term, "I have not been well since my baby was born"? As De Lee says, this should make us heed the warning.

In general infection following full-term labor, there is no indication for local intervention. Do nothing locally, avoid manipulation, shun packing, shrink from irrigation and scorn curettage. There is no indication for any manipulation or even examination unless, of course, one feels suspicious of the existence of a distinct local accumulation. Douches either vaginal or uterine are harmful.

Bland can see no indication for packing the uterus. Ordinarily in this type the organ is relaxed and the cervix wide open. Gauze packing, therefore, would not do any good, and does gauze act to any greater advantage in the uterus than in any other field? Are we not taught that gauze ordinarily as a drain usually obstructs more than it drains?

Curettetment in concrete cases is pernicious, mischievous, dangerous and at times fatal. It results in destroying the natural breastworks of protection and thereby throws into the blood additional hordes of bacteria that may be sufficient to overthrow all the reinforcements which Nature may be able to rush to her defense and thus cause a fatal issue.

Their custom in cases of this character is, first, "hands off!" They do nothing locally excepting to keep the patient clean externally. Whenever possible, patient is provided with a quiet room; if impossible, in an isolated section of the ward behind a screen. Exposed to all the fresh air and sunlight possible. The head of bed is elevated to limit any local infective process to the pelvis, and favor drainage, providing, of course, there

is anything to drain. All forms of nervous excitement and emotion are absolutely prohibited. Water is given freely and in abundance. Regardless of the temperature, these patients are fed. The more nourishment she takes, the better able she will be successfully to battle with the poison.

Active purgation is never resorted to, rely on low enemas or mild laxatives. As water is given freely and abundantly by the mouth, so instillation of saline solution both day and night is introduced by bowel.

In infection with material confined within the womb, providing the cervix is open, the treatment should consist in gently removing this substance either with the finger or placental forceps, but under no circumstance should the removal be followed by irrigation or curettage. If the cervix is closed and the material cannot be reached and easily withdrawn, one would help the patient by leaving it absolutely alone, and Nature will more effectively and with a greater degree of safety expel the contents than the surgeon.

Where there is much odor or discharge or both, do not be led to believe that this symptom and sign demand treatment. The fact the patient has profuse discharge indicates that she is expelling the material. Odor is usually not significant of danger, but it may become so, however, if meddlesome surgery is practiced. Odor may indicate the existence of a concealed spark and if this is fanned by manipulation it may cause a conflagration.

Analysis of Puerperal Fever With Special Reference to Prognosis and Treatment. Watson and Scott⁵ analyze the cases in the Toronto General Hospital from July 1, 1914, to Dec. 31, 1916. As the standard of morbidity they take that laid down by the British Medical Association, viz., "All fatal cases and all cases in which the temperature exceeds 100° F. on any two of the bi-daily readings from the end of the first to the eighth day after delivery." During the period mentioned, the total deliveries in the wards were 2,096. Of these, 476 (22.9%) showed a morbidity according to the above standard.

As a result of their analysis they state that in 85 per cent. of cases developing fever in the puerperium, the fever quickly subsides without any definite pathologic lesion developing. When one does develop, it does not manifest itself for some little time after the first rise of temperature.

When a definite lesion is present in the pelvis the infection starts as a wound infection of some part of the genital tract, *viz.*: (a) An ulcer of the perineum, vagina or cervix; (b) infection around sutures; (c) infection of retained secundines; (d) localized infection of the interior of uterus, in which case it will likely be at the placental site; (e) or, it may be a primary blood infection, in which case it is of the autogenous type.

The primary infection may remain localized for varying lengths of time or it may spread by: Continuity of tissue, the blood or the lymphatics. And it may spread in any of these ways from any given primary focus. *E. g.*, we may get a pelvic cellulitis from an infected perineal suture, a torn cervix, or an infection of the placental site.

The lesions arising from the spread by continuity are usually either pus tubes, pelvic peritonitis, or a general peritonitis. Any of these may arise from various organisms, but the two commonest are the gonococcus and streptococcus, and they usually present different clinical pictures. The lesions due to the gonococcus are ordinarily developed late in the puerperium, especially if the infection has followed labor, whereas with the streptococcus the initial symptoms appear earlier and prognosis is graver.

Infection spreading by the blood-stream is usually of the thrombo-phlebitis type, which ordinarily begins in the thrombosed veins of the placental site, though it may occasionally arise from primary infection in the perineum or vagina. The terminal results are localized abscesses in the wall of the uterus, pyemia, or septicemia.

Infections spread by the lymphatics in most instances give rise either to a cellulitis or to septicemia. In cellulitis, the original focus is usually in the cervix or the uterus, though it may arise in the vagina or perineum. The lymphatic type of septicemia is the most serious of

any of the puerperal infections arising early, leaving no local lesions and ending in death in most instances.

The type of organism is not of as much importance as the situation in which that organism is growing, *i. e.*, as the anatomic lesion. One may get a fatal bacteremia as well as pus tubes due to the gonococcus, or a cellulitis or a thrombo-phlebitis as readily as the so-called sapremia in the case of the streptococcus.

We have at present no means of treating primary infection in the uterus which does not at the same time favor extension of the inflammatory process of the surrounding tissues or the blood-stream. Therefore, all cases should be treated expectantly during the early stages. When a definite pelvic lesion does develop it should be dealt with along the lines of established procedures.

The pathologic process of puerperal fever is the same whether the sepsis follows labor or abortion.

Ligation or Excision of the Pelvic Veins in Puerperal Pyemia. C. J. Miller⁶ has been able to collect 197 examples of this mode of treatment. Cases of extensive cava thrombosis, acute peritonitis, faulty ligation of vessels, broad ligament abscess and multiple metastatic processes should not be included since they are distinct contraindications.

The location of the thrombus *at the time of operation* is given in 100 cases:

Vein involved.	No. of times.
1 spermatic	75
2 spermatic	5
1 hypogastric	6
1 hypogastric and 1 spermatic.....	6
1 common iliac	8

This proves conclusively the tendency of the thrombosis to limit itself for one vein, usually the spermatic, and that a marked difference exists as to the frequency and location of thrombi when viewed at operation and at necropsy.

The percentage of recoveries after operation has not been as encouraging as had been hoped, but, as a whole, the results were not altogether discouraging. Of the 197

cases, 15 were treated by the extra- and 182 by the transperitoneal, operation. The gross mortality (not including the vena cava series) was 51.6 per cent. The corrected mortality was 33.9.

In 103 instances the time of operation was given:

Operation.	Total.	Recoveries.	Deaths.
During first week	13	9	4
During second week	27	12	15
During third week	20	10	10
During fourth week	20	8	12
During fifth week	11	8	3
During sixth week	7	3	4
During seventh week	5	2	3

The other cases were operated upon in from 8 to 11 weeks, but the number was too small to be of value.

Puerperal Uteropelvic Thrombophlebitis. A. Turenne⁷ asserts that this condition has signs, symptoms, and a clinical evolution which permit a diagnosis to be made in most cases.

Although in more than half there is a tendency toward subsidence and recovery, the high mortality justifies modern methods of treatment. Intervention, especially ligature of the thrombosed veins, is rational. In his opinion venous ligature is *indicated*—

1. When the septic lesion is directly diagnosed and there is no persistent bacteremia between the chills. 2. The genital and general clinical examination does not show any visceral foci which indicate generalization of the infection, utilizing all present-day methods (leukocyte count, biopsy, x-ray, etc.). 3. Direct examination gives doubtful results but where the clinical progress is characteristic.

Ligature is *contraindicated*—

1. In persistent bacteremia or confirmed septicopyemia. 2. When there are predominant uterine or juxtauterine lesions.

Doubtless in many cases while not proceeding to ligature or holding a doctrinal conservative position laparotomy will afford a favorable solution of certain clinical problems.

The transperitoneal route is preferable. Ligation of all the efferent venous trunks of the genital zone is de-

sirable. Resection or evacuation of the thrombus should be resorted to only exceptionally.

Treatment With Arsphenamin. Miller and Chalfant⁸ announce that they have treated 11 cases of puerperal infection with arsphenamin (arsenobenzol) given intravenously, usually in 0.6 gm. doses, as frequently as 3 or 4 day intervals, giving from one to four doses. There were no toxic effects other than a mild albuminuria. Seven patients had a streptococcus in the blood-stream, and 2 of them died; 2 had a gram-negative bacillus; both lived. Two had a negative blood culture, but were classed as cases of bacteremia clinically; both died. Two had intra-uterine irrigations with neutral solution of chlorinated soda at 2-hour intervals; 1 died. Necropsy revealed the uterus free from infection, death was due to multiple abscesses of both kidneys. They have been able to rid the blood of its invading organism in every instance. All varieties of organisms so far encountered seem to be equally influenced. After arsphenamin has been given there is a marked increase in the leukocyte count. If, after this time, there is a decided decrease, it is possible the patient has reinfected herself, and arsphenamin should be given without waiting for confirmation of the culture report. The blood is usually found sterile in 24 hours, always in 48, except in one case in which only 0.4 gm. of arsphenamin were given. Rabbit experiments indicate that a dose of 6 mg. is necessary to secure prompt results. In suspected infections, arsphenamin may be given immediately after a culture to avoid waiting for a laboratory report.

[The Editor after added experience has seen no reason to alter the treatment recommended in his book, and often mentioned in these Year Books.—ED.]

OTHER CONDITIONS.

Acute Inversion of Uterus. While inversion occurs with other conditions, it most frequently follows labor. Out of 400 cases collected by Crosse, 350 were for parturient inversions. The statistics of several large hospitals are quoted: In the Vienna Maternity from 1849

to 1878 in more than 250,000 labors there was not a case. In the Dublin Rotunda one case occurred in 190,000 labors. In St. Petersburg there was not a case among 200,000 births. Winckel had 20,000 labors without a case. The accident occurs perhaps more frequently in private practice for obvious reasons.

The case reported by J. M. Griffin⁹ concerned a primipara, aged 35. When 30 years old epilepsy developed, but less frequent for previous year, last attack a month before labor. Author was called early in morning, but dilatation very slow. About 6 p. m. patient was becoming exhausted and it was decided to use forceps, reluctantly used on account of the epileptic history. Under ether at 6:30 p. m., forceps applied, and child delivered about 7:30. When the head was delivered the cord was twisted around neck once, and as the body was born the cord was found twisted around leg. As the patient was under anesthetic for some time and pulse quite rapid it was decided to express the placenta by Credé's method, but Griffin was unable to feel the fundus. The placenta was protruding somewhat through cervix with cord attachment directly in center. On grasping the placenta it yielded very easily and came through the cervix bringing the fundus with it so the whole mass was entirely outside vulva. The placenta was completely attached throughout its entire circumference directly in the fundus. The dividing line between placenta and uterine tissue was difficult to make out. At one point he found a small detached spot, and began stripping from this point, which was done without difficulty. The cervix could be felt like a collar around the lower segment of uterus. There was very little hemorrhage. He at once began taxis, felt the fundus slip through the cervix with a quick jerk. Placing hand inside the uterus he was able to restore the fundus to its normal position. Ergot and pituitrin administered to promote contraction. No evidence of shock although the pulse was up to 110. Incontinence of urine for several days. On 9th day patient complained of pain in right leg and examination revealed a beginning phlebitis. About 5 days later a left-sided phlebitis devel-

oped. Some two weeks following both sides were cleared up entirely. Good recovery.

A few days previous to report examination showed uterus to be in perfectly normal condition. It is interesting to note the number of predisposing causes that were present: A relaxed uterus, perhaps increased to some degree by the anesthetic, completely adherent placenta with a perfect fundal attachment, a shortened cord by being twisted about the neck and leg, and a prolonged hard labor terminated by forceps. Apparently the inversion had started simultaneously with the delivery and, according to Rokitansky, once partial inversion occurs, the uterus seizes the prolapsed portion and endeavors to thrust it out as it would any foreign body. Where so many predisposing factors were present the inversion would probably have been spontaneous had it not been for the anesthetic.

Fatal Case of Inversion. The patient, an VIII-para, was 37 years old. She had never been attended by a medical man except with her sixth child, when "the afterbirth was stuck."

The present labor commenced at 4 a. m., and at 10 a. m. a full-time living female child was born. According to the "gamp" in attendance, the patient signalized the birth by violent movements, which gave the attendant much ado to keep her in bed, at the same time clutching at the position of the fundus. She complained of great pain, and felt sick. There was no unusual hemorrhage. At 10:20 the placenta "came away," together with a "lump," for the delivery of which R. A. G. Malcolm¹ was summoned. He arrived at 10:45 and found patient most obviously moribund. A completely prolapsed, inverted uterus, with portions of the membranes attached, was in contact with a filthy sack on which the patient was lying. Death 10 minutes later.

The patient was decidedly alcoholic, but withal hard-working. She suffered from enteroptosis. Examination disclosed an old laceration of cervix and perineum. The laxity of the uterine wall was marked, but it was not more evident in the fundal than in other portions. The cord was not unduly short (48 cm.), and the midwife's

(1) Med. Jour. of Australia, Nov. 24, 1917.

evidence was that it was not twisted round the neck at least. Death must be attributed to shock acting on an undermined (alcoholic) constitution; nevertheless, the rapidly fatal termination appears extraordinary. The shock may or may not have been aggravated by traction, as the woman in charge evidently expected the "lump" to come away.

Post-partum Hemorrhage. In a consideration of this subject, H. Thomas² remarks that the active treatment depends primarily upon the cause. If the lower parturient canal is lacerated and the fundus well contracted, as a rule serious bleeding will come from the cervix. This must be exposed by a vulsellum or stitch and any laceration present closed by chromicized catgut.

The great majority, however, have their origin in the uterine cavity, and here we have 4 general methods: 1. We may maintain uterine contraction by manipulation. The fundus is grasped through the abdominal wall and manipulated until it contracts well and the contents are expelled. When this has occurred the hand should be held in a position of continuous pressure upon the fundus ceasing any vigorous manipulation unless the fundus relaxes and begins to rise when it may be stimulated by kneading as before. 2. The prompt results from 1 c.c. of pituitrin by hypodermic intramuscularly can not be overlooked. At the onset of any serious hemorrhage accompanied by a poorly contracted uterus, pituitrin should be used immediately. The action is as a rule almost immediate and although somewhat transient, still it will "hold" the uterus until some more lasting drug may assert itself. Bearing this in mind it is well to administer 1 or 2 c.c. of ergotole hypodermically in the same way immediately after the pituitrin. On account of its rapid action it is indispensable. 3. The intra-uterine douche. A sterile douche bag, tube and nozzle—plain glass is preferable—should be carried in the outfit. The douche is of normal saline 110° to 120° F. carefully given, high in the uterine cavity. Boiled water or a 2 per cent. acetic acid solution may be also used. The main point is to give the douche quickly and give it hot. 4. The intrauterine gauze

pack. For this plain sterile gauze may be used as the action is wholly mechanical. It is best carried in large glass tubes in a somewhat thick strip. A good emergency packing may be obtained from a 2- to 4-inch sterile gauze bandage. The one point to remember is there should be no space in the upper part of the uterine cavity after the packing is inserted. The pressure of the gauze pack against the wall of the uterus maintains the contraction and thus stops hemorrhage. Therefore the packing must be firmly and thoroughly done. To insure this, one hand may be placed upon a sterile covering over the fundus during the process. In case the packing does not control hemorrhage we may feel quite certain the packing has not been carried high enough. The packing had better be removed, a hot intrauterine douche given and repacking done with new gauze.

The supportive methods are the same as for hemorrhage in other locations. Saline should be administered by intravenous infusion or by hypodermoclysis in the severer grades and water by mouth and saline per rectum in the lesser grades. Morphine is given for its quieting effect, the foot of the bed is raised, external heat applied, etc.

[It has become the routine practice of the Editor after operative deliveries, and in cases where post-partum hemorrhage is anticipated, to give 1 c.c. of pituitrin, immediately the child is born, and as soon as the placenta is out, 1 c.c. of ergot. In this way the hemorrhage of these cases has been materially reduced, and the necessity for other measures, especially gauze packing, almost eliminated.—ED.]

Gangrene of Fibroid Following Parturition. A colored woman, aged 24, had had 4 children. She was admitted with a temperature of 100, pulse 88, and respiration 24. The same day normal delivery of a living premature child. When seen by R. Waldo^{2a} two days later the temperature was still high, and the pulse had risen to 120. The os was open and a tumor easily palpated within the cavity attached by a broad base. Lochia profuse but no fetor. On 4th day, abdominal

panhysterectomy was done. There was a gangrenous fibroid, the whole endometrium was sloughing and very foul, but apparently no involvement of the endometrium. Recovery delayed by lobar pneumonia. Waldo has seen 2 similar cases, and is convinced early panhysterectomy before the peritoneum is involved gives the best chance for life.

Conservation of Maternal Nursing. Conservation of the breast food in the first 2 months, so G. E. Baxter³ claims, practically insures a breast food for the infant in the second (3d to 6th months) and third (7th, 8th, and 9th months) periods. The first is the most serious for mother and babe.

Proper management of environmental conditions should receive most patient and careful consideration. The appearance of the stool is relatively unimportant, as is laboratory examination of breast milk. The physician must recognize that the conservation of the mother's milk, can only be accomplished by his careful and conscientious attention to details. The importance of properly regulated mixed feedings as a means of conserving maternal milk, is urged.

Care of the Functioning Breast. F. C. Ainley⁴ has for some time made a special effort to increase the percentage of breast fed babies among his patients, and is fully convinced that the percentage of those who are truly physically unable is extremely small.

Preparations should begin early in pregnancy. A careful physical examination, correction of abnormalities—anemia, constipation, etc., regulation of diet, and the stimulation of normal elimination, especially of the skin, are important. The patient should be assured of her ability to nurse satisfactorily. Retracted nipples should be drawn out; and during the last month or longer, the nipples should be scrubbed each night vigorously with castile soap and treated freely with lanolin. Lanolin makes the skin soft and pliable, and has given much better results than preparations containing alcohol, which though they harden the skin, tend at times, to favor cracking when the baby nurses.

(3) Illinois Med. Jour., December, 1917.

(4) California State Jour. Med., January, 1918.

About 12 hours after delivery the child should be put to the breast. Nursings from the beginning should be regular and as thorough as possible. It is the regular, frequent, thorough stimulation, which assures a good milk supply. The child should nurse every 3 hours during the day and every 4 hours during the night from the beginning.

After the mother's bowels have moved well, she may be allowed any food which agrees with her. Green vegetables and acid fruits do not as a rule cause any trouble. Plenty of wholesome food, and a normal amount of fluids are the essentials.

There is no such thing as complete absence of milk if the baby nurses. The milk always comes in, usually the 3d to 5th day, but on one occasion a sufficient supply was obtained only after 3 weeks' effort.

Much harm is frequently done, by meddlesome treatment when the breasts first become engorged.

When the amount is insufficient it is wise to eliminate all unnecessary wasting of nerve energy, visitors, etc. It is customary also to force liquids and food. Many galactagogues have been recommended, but they have little if any value over good food. Provided the patient is getting a normal amount of rest, fresh air, food and liquids, the one thing which will do the most to bring up the supply is regular, thorough emptying of the breasts by natural methods if possible, by artificial means if necessary. Stimulation of the breasts after they are empty will make more milk come later. A hungry baby is desirable, and it is always, when possible, wise to avoid any artificial feeding, either before or after nursing, and only in exceptional cases is it wise to allow the child to nurse both breasts at one feeding.

One of the most valuable and simplest procedures we have is the weighing before and after nursing. When the amount gained in the usual time is insufficient, the baby may be put back to the breast for a supplementary nursing of a certain number of minutes. This has the advantage of giving more food and giving the breasts additional stimulation. If the child is premature, the additional stimulation may be obtained by a breast pump.

The point which is usually overlooked is that moderate hunger is a good thing, for it is hunger which causes the child to stimulate the breast and automatically increase the food supply. To give artificial food prevents the extra stimulation, and further diminishes the milk.

Many obstetricians advise cutting out one or two night feedings as early as the child will sleep past them. This is a mistake, although it is desirable that the patient have unbroken sleep when possible, and some babies will sleep well all night. The milk supply is almost always materially diminished a very few weeks after omitting one of the night nursings, and for this reason Ainley urges all of his patients to continue the 4-hour schedule during the night until at least the end of the 4th month.

A breast fed baby that is gaining 4 or more ounces a week and whose bowels are moving one or more times daily rarely has a severe illness, and provided the bowels move once a day or oftener, the color and consistency or the presence of mucus or curds, is of little importance.

The routine analysis of a single specimen of mother's milk is of practically no value and he has long since ceased making these examinations.

Contraindications to nursing in a woman who has borne a healthy child, are relatively few. Those generally recognized, are acute pulmonary tuberculosis, healed tuberculosis, insanity, epilepsy, certain chronic wasting diseases, severe hemorrhages, and chronic nephritis.

Effect of Desiccated Placenta During First 11 Days of Lactation. No definite conclusions are reached in this preliminary report by L. G. McNeile.⁵ The most marked change was an increase in the percentage of lactose, accompanied by a slight increase in the protein, and a slight decrease in fat. There was no deficiency in the amount of milk in any of the cases receiving the placenta, but the opposite was true in the cases which did not. At the end of the 11 days the babies whose mothers received the agent were about 4 oz. heavier than those that did not.

[We have tried placenta at the Chicago Lying-in Hospital, and it did not increase the amount of milk.—ED.]

Tubercle Bacilli in Milk of Tuberculous Women. At Sea View Hospital (Staten Island, N. Y.) during 18 months Wang and Coonley⁶ examined the milk of 28 patients. Some gave birth to children in the institution, others entered after labor elsewhere. There were 12 moderately advanced, uncomplicated; 1 moderately advanced with an orthopedic complication; 2 moderately advanced complicated by tuberculous laryngitis; 9 far advanced, uncomplicated, and 4 far advanced complicated by laryngitis. The ages ranged from 19 to 40. Their manifestations varied from the chronic indolent fibroid to the rapid fulminating miliary types. One-half seemed to show some improvement during their stay, 4 died inside of a month after delivery, and 10 showed no improvement. Most were multiparas. There was no apparent mammary disease or suspicion of such in any case.

Specimens from 15 cases were injected into guinea-pigs, intraperitoneally. All were negative.

There were about 450 microscopic examinations of specimens taken biweekly from the whole 28 cases. These were all negative except one, which was positive once, and one other specimen from the same case which was suspicious once. The specimens were taken both before and after childbirth and from the one who nursed her child. In one case they obtained specimens regularly for 88 days before labor, and in another case for over a year since labor. Colostrum was frequently examined and twice injected into guinea-pigs.

The observations of others, and these experiences indicate that bacilli are infrequently found in the milk of tuberculous women who have no mammary disease. The possibility of infection is probably slight, but it is very likely best to interdict nursing, because the other factors, *e. g.*, the danger of infection during the intimate relationship of the mother and nursing child, the possibility of toxic substance in the milk and the frequent bad effects of nursing on the mother, would seem, collectively, to be sufficient reason to resort to artificial

feedings. An exception might be made that a mother with a closed case of tuberculosis should be allowed to nurse, although it is often difficult to distinguish between a closed and open case after pregnancy and labor. Such women undergo a profound strain before and during childbirth, and it frequently takes a long period to ascertain if their disease has been activated.

Childbirth and Tuberculosis. Some time ago a ward in the Sea View Hospital was designated for the care of pregnancy and childbirth in tuberculous women, and some experience there is recorded by McSweeney and Wang.⁷ Altogether there were 18 births, one patient having 2 children born in the hospital, the second being 3 years after the first.

The duration of the tuberculosis is that stated by the patient, and is the duration of the clinical tuberculosis, *i. e.*, the length of time the tuberculosis has been evident to the patient. Ten stated the onset occurred before pregnancy; of these, after labor, 4 died, 3 seemed improved and 3 seemed unimproved. Three stated the onset occurred about the time they became pregnant; of these, after labor, 1 died and 2 seemed improved. Five stated the onset occurred after they became pregnant; of these, after labor, 4 seemed improved and 1 unimproved.

During pregnancy, as near as could be ascertained, 10 seemed to retrograde, 5 to improve, and 3 were apparently unchanged. After labor, of the moderately advanced, 7 were improved; of the far advanced, 5 died, 1 improved and 5 retrograded.

The effects of pregnancy and labor on the tuberculous disease are extremely problematic. Not only are the effects variable, but they are difficult to foretell, and frequently a long period is necessitated to ascertain the ultimate effects. In open active tuberculosis, seemingly, there is rarely a good effect, especially when the onset of the clinical tuberculosis has occurred before pregnancy. When the disease seems to have little activity and has never been very active, some will apparently improve during pregnancy and after labor. It is questionable if the prognosis in such cases is bettered. In

others, pregnancy and labor frequently seem to whip a slightly active tuberculosis into a quickly fatal disease. Generally, the less the tuberculous disease and particularly, the less the activity of the disease, the better the prospects of the mother. One, however, is impressed with their inability, considering all things—such as the stage, activity, complications, etc., of the disease—to foretell in the individual case what effect, if any, pregnancy and labor will have.

Obstetric Accidents as Cause of Gynecologic Conditions. While child-bearing is considered a normal function, W. C. Kasten⁸ quotes from De Lee as follows:

"Can a function so perilous that in spite of the best of care, it kills thousands of women every year; that leaves at least one-fourth of the women more or less invalided and a majority with permanent anatomic changes of structure; that is always attended with severe pain and tearing of tissues, and that kills 3 to 5 per cent. of the children; can such a function be normal?"

Kasten does not go into technical details, as they can be found in textbooks, but refers particularly to "the chapter on obstetric accidents in De Lee's matchless work."

After every confinement we should take a good light, *e. g.*, one of the many handy pocket electric lights, a pair of suitable retractors—Prior's trowels or De Lee's various-sized specula or even the Sims speculum, and make a thorough inspection of all lacerations which should be repaired at once, or not later than 24 hours after delivery; possibly excepting some lacerations of cervix and small tears and abrasions of mucosa.

Every woman should be examined during the 4th to 6th weeks, to ascertain if healing of the lacerations have taken place properly, if the uterus is undergoing proper involution and as to its position. If retroversions are now put and kept in place, as the uterus and its ligaments are shrinking to normal, the probabilities are it will remain so. The patient should be examined at weekly intervals to see that it does remain so during this involutional period. If not, a properly fitted pessary

will usually insure results and it may be necessary to wear it 6 months. This means a lot of extra service and all who can should be made to pay for it, and if the facts are properly presented, the fee will usually be forthcoming and one's reputation for this line of work correspondingly enhanced.

PART IV.

THE NEW-BORN.

Suture vs. Ligation of Cord. Rendleman and Taussig⁹ report a study of 450 normal babies. In half of these the cord was amputated by the suture-ligature method of Dickinson; in the rest, it was ligated with 2 tape ligatures, one of which was placed near the skin margin of umbilicus. No antiseptics were used except a single ap-

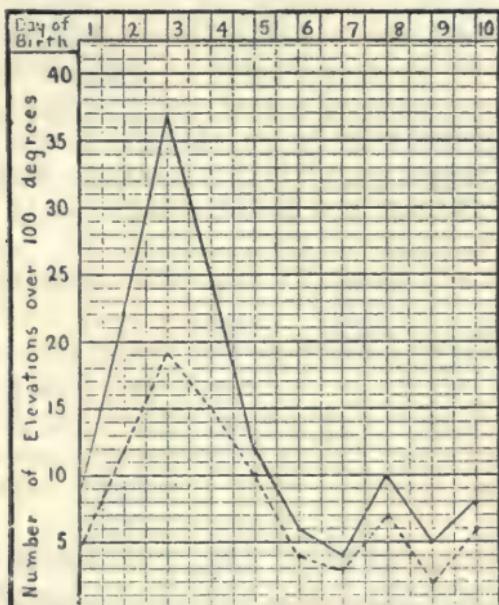


Fig. 12. Suture vs. ligation of cord (Rendleman and Taussig). Temperature elevations over 100 F.; solid line, sutured patients; broken line, ligated patients.

plication of alcohol to the skin margin in the amputated cases. Dry sterile gauze was placed over umbilicus and left until the suture was removed or the cord came off, unless the dressing was accidentally soiled. All the babies were cared for by the interns, supervised by the

senior physician. The nursing was in charge of a nurse who has been head of the obstetric division for a number of years.

As a result of this study they are of the opinion the suture-ligature method will not greatly decrease the number of umbilical infections. If asepsis is lacking, whether the cord is amputated or ligated is of secondary importance. Umbilical hernias can not be prevented. The greater immediate loss of weight and greater frequency of slight temperatures after suturing emphasizes the initial shock and the necessity of restricting this method to the direction of persons of obstetric experience.

The more rapid gain of the sutured baby after the 5th day shows the slow healing by the ligation method is to some degree a drain. The time saved by the nurses when the cord is amputated is considerable, and of economic importance. They therefore urge the adoption of the Dickinson method in all maternity institutions under due precautions. It has certain definite advantages which, though not great, should make it the preferred technic.

[The slight advantage, if any, is not worth the trouble.
—ED.]

Hematemesis and Melena, Recovery. In a boy-baby, whose case is related by W. Marriott,² vomiting of blood began 28 hours post-partum and the tarry stools 7 hours still later. Recovery followed subcutaneous injections of human serum, together with a gelatin mixture internally.

Artificial Respiration in Asphyxia Neonatorum. Of the classic methods, mouth-to-mouth insufflation has proved more efficient than those dependent on manipulation. The manipulative methods of Prochownick, and Schultz' swingings are all useful in asphyxia livida, but in the more critical asphyxia pallida, mouth-to-mouth insufflation or insuflation through a tracheal catheter will frequently succeed after these methods have failed.

There are, however, serious objections to mouth-to-mouth insufflation, and to avoid these C. L. Heald³ had

{2} British Med. Jour., Oct. 20, 1917.

{3} Jour. Amer. Med. Ass'n., April 13, 1918.

an instrument made, which has proved very satisfactory. It consists of a syringe bulb connected by tubing with an air valve in the dome of a small helmet-shaped mask, and by a Y-tube with an ordinary rubber toy

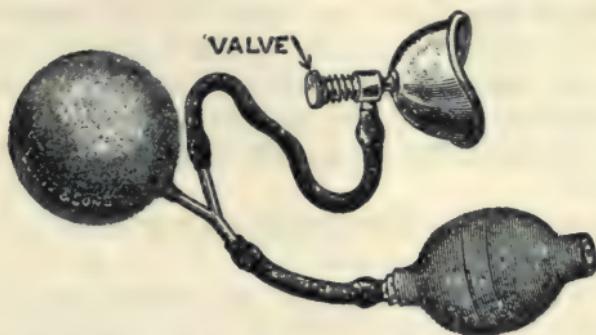


Fig. 13. Instrument for artificial respiration in asphyxia neonatorum (Heald).

balloon. The latter serves as a reservoir, and, as its expansile tension is about 8 mm. of mercury, it prevents the air pressure in the lungs from rising above that point. It also produces a uniform, steady flow of air.

Stillbirths. This topic is elaborated by C. S. Miller⁴ who is chief of the Division of Statistics, in the Philadelphia Health Department. There are 3 phases—the definition of birth, of stillbirth, of abortion, miscarriage and premature labor.

By birth is meant the complete separation of the fetal organism from the maternal body. From a statistical standpoint the umbilical cord need not be cut or tied, nor need the placenta be separated.

Stillbirth is defined as a child or fetus that neither breathes, moves nor shows signs of life. This, of course, presupposes that the body is viable. Therefore, a child showing any cardiac action—in the true sense of the word—is not stillborn.

[A child is either dead or alive. Some years ago the Editor resuscitated a child which had neither respiration nor auscultatable heart tones. How would this be classified?]

Medical definitions permit of a certain latitude in regard to the difference between the terms abortion, mis-

carriage and premature labor. Some authors define the expulsion of the products of 3 months or less in utero gestation as an abortion. Others extend the period to the age of viability (approximately 6 1/2 months). The term miscarriage is often used interchangeably as a synonym for abortion or premature labor. Premature labor on the other hand is often construed as any labor which develops before the calculated time.

Miller believes the most generally applicable view is as follows:

Abortion.—The expulsion of any product of concep-

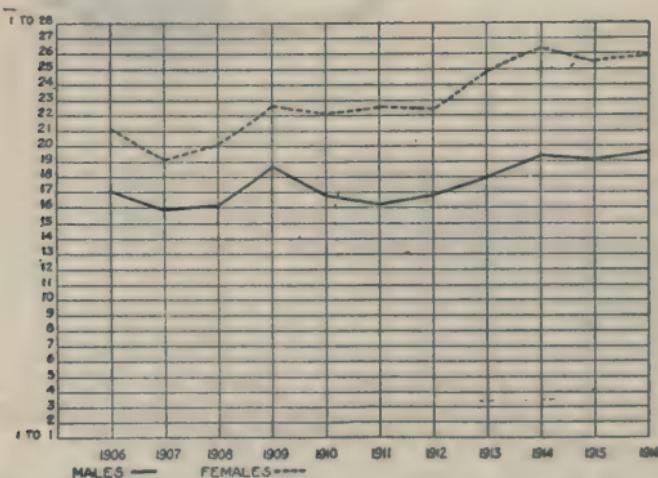


Fig. 14. Stillbirths by sex as compared with living births (Miller).

tion prior to 4 months or subjectively before "quicken-ing." At this period the placenta is not definitely dis-tinguishable from the remainder of chorion. *Mis-car-riage*.—The expulsion of any product of conception from 4 months to the age of viability, usually considered to be about 6 1/2 months intrauterine. *Premature Labor*.—The expulsion of any fetus from the age of viability to full term. In the diagram some idea may be gained of the stillbirths by sex as compared with living births.

The factors which may be held responsible for still-births fall under 2 general headings: (A) Maternal con-ditions; (B) Conditions affecting the fetus. Under (A) unusual exertion, unusual irritability of the uterus, va-rious toxic states of the mother, over-distention of the

uterus, etc. Under (*B*) certain pathologic conditions of the chorion or of the ovum itself.

Of the last 100 certificates of stillbirths turned in to the Department, 50 gave no contributory cause of death, while 36 stated as contributory cause premature birth. Of the remaining 14, which are not a sufficient number on which to base any estimate of frequency, the following causes were given: Syphilis 4, injuries at birth 5, strangulation of cord 3, polyhydramnios 1, convulsions of the mother 1.

In dealing with the subject of stillbirths as practitioners of medicine, we have an unlimited field for investigation. There should by all means be a more detailed statement made on the mortality bills as well as a proper classification and standardization of our terminology.

Antenatal Syphilis—Suggested Action of the Chorionic Ferments. In his presidential address, A. J. Routh⁵ said he believed that 25 per cent. of stillbirths and abortions in urban centers were probably due to syphilis, that if only 20 per cent. were so caused in England and Wales, about 27,000 deaths would occur annually during the antenatal period and the first 14 days after birth from that cause. The mortality of illegitimate children, both in utero and after birth, from syphilis was at least twice as heavy. The next most frequent causes of antenatal and natal deaths were toxemia, ante-partum hemorrhage, and dystocia. Macerated fetuses are now known to contain spirochetes in over 80 per cent., though the mature organism is rarely found in abortions before the 14th week (Weber). Many mothers and offspring show no evidence till some weeks after the childbirth.

The great changes in the maternal tissues, and especially in the ductless glands, are only gradually produced, and are not available in the early weeks to deal with spirochetal infections. There are, however, locally present very powerful ferments produced by the syncytial cells of the chorionic villi. Such ferments are present early in pregnancy at the interdigitations of the fetal and maternal portions, and therefore are available as a powerful chemical filter for the protection of both mother and child. Their action is primarily trophoblas-

tic to enable the chorionic villi to penetrate the mucosa at the placental site, and open up maternal vessels, so the ovum may have a resting place with blood spaces round it.

His suggestions seem to point to the following conclusions, some of which are scientific facts, while others are non-proven, but logical.

The "granules" are the result of the "spirilloysis," or breaking up of *S. pallida*. They are infecting agents, and able to develop into the mature spirochete in a suitable environment, or may become biologically inactive and remain latent.

The chorionic ferments (or their derivatives) are suggested as being capable of exercising their destructive properties upon *S. pallida*, which may either be in the maternal or fetal intravillous tissues, both of which are in intimate relations with the syncytial cells whence the ferments arise. This destructive action of the ferments upon the spirochete breaks it up into granules.

During pregnancy it is the continued action of the ferments upon the granules which may render them latent and biologically inactive, and perhaps in a few cases may destroy them. After pregnancy, when the chorionic ferments cease to be present in the mother and child, the granules, wherever they may be, may develop into mature spirochetes. The success or failure of the ferments to protect the mother and child from spirochetal infection would depend upon (a) the virulence of the infection, which tends to diminish, owing to the presence of more maternal antibodies, with each successive pregnancy; and (b) upon the source of the infection. Infection is probably most difficult to arrest in a "mixed transmission," or in a true maternal infection, where attempts at infection of the embryo would be constantly proceeding throughout pregnancy. It is probably least severe, and most easily countered by the ferments, when the primary infection is paternal, for it may then be a single infection only, and probably not capable of repetition if the primary infection be arrested.

The Wassermann in mother and child appears to be negative if infection has been only by spirochetes in the

granule stage, so long as the granules remain biologically inactive and the mature organisms are absent.

Syphilis as a Cause of Stillbirths. A series of 48 stillbirths in 1,500 obstetric cases at the University of Michigan, is analyzed by R. A. Bartholomew.⁶ Of the syphilitic cases in which Wassermanns were made, 50 per cent. were positive. He believes syphilis is the causative factor in at least 1/3 of the stillbirths from the time of viability to full term, and a Wassermann is strongly indicated where there have been suggestive clinical symptoms, unexplained abortions, or premature labors with macerated babies.

A combination of mercury and salvarsan is more effective in assuring the birth of a healthy infant than salvarsan alone.

Important evidence in the diagnosis of syphilis can be obtained from microscopic examination of the placenta, or in stillbirths examination of the liver by the Levaditi method.

(6) Jour. Amer. Med. Ass'n., Feb. 2, 1918.

PART V.

MISCELLANEOUS OBSTETRICS.

Three Thousand Confinements in Private Practice. This number were attended by S. P. Ford⁷ in over 50 years. Of the children 1,574 were boys, 1,424 girls, and 2 doubtful. He refers to 36 cases of twins, so must count each birth as a "case." The first 5 labors were abnormal: (1) Anencephalus; (2) twins, both breech; (3) a shoulder presentation, requiring version; (4) cervical rigidity; and (5) post-partum hemorrhage. After this normal cases came till a placenta previa some years later. He had 20 cases of eclampsia and lost 5 mothers; in all the fatal cases the seizures came on before delivery. He had 4 examples of hydatidiform mole, 2 of which were twin cases. There was one inversion of the uterus, due to traction upon the cord by the midwife before his arrival. Ford used forceps in nearly 200 instances, but of late years he has relied more upon pituitary extract. More than half his patients were primiparas, and one patient who was giving birth to her 16th child. His youngest patient was 13 1/2 and his oldest lacked only two months of her 50th year when she had a baby; in both the labor was comparatively easy. There were three cases in which 14, 16 and 17 years respectively intervened between the 1st and 2d pregnancies.

Obstetric Fads and Heresies. After a protracted rest from his accustomed pursuits, E. H. Grandin⁸ finds the obstetric art cumbered with much that is new and helpful, but also with many fads and heresies which must cause his masters in obstetrics to stir uneasily in their graves. For 40 years he has been a student of this art, and Buckingham (Boston), Tarnier (Paris), Robert

{7} Canadian Med. Ass'n. Jour., 1917, p. 412.
{8} Med. Record, Dec. 8, 1917.

and his teachers were giants in their days: Reynolds Barnes (London), Karl Braun (Vienna), Schauta (Prague), I. E. Taylor and Fordyce Barker (New York). These men lacked but one thing which we possess today—asepsis in obstetrics.

The first fad he refers to is "twilight sleep." In the fourth edition of "Practical Obstetrics" Grandin analyzed the data from German sources, and showed that these damned the method. To his medical brethren, he gives the following advice: "Avoid the folly of extremes, and hold fast to that which is good. Use chloral freely, and be not afraid; resort to morphine and atropine with judgment; administer quinine judiciously after the contractions are well under way; be not afraid of chloroform; do not delay the application of the low forceps after a timely fashion. Thus you render labor as nearly painless as our present knowledge permits, without subjecting woman or child to the dangers inevitably associated with the use of morphine, hyoscine and scopolamine."

The second fad is the Cesarean-section craze. It was his fortune to perform the early sections from an *elective* standpoint; *i. e.*, under the relative indication, at the N. Y. Infant Asylum and at the Maternity Hospital in 1889-90. After the lapse of 20 years, with the experience thus gained, he can preach the same sermon to his obstetric friends—*Festina lente!* After carefully analyzing the series recorded by a number of operators, it's "dollars to doughnuts" that Tarnier or Isaac E. Taylor, if alive, could cut the series at least 30 per cent. Grandin wonders if some of the operators are trained in the technique of version, if they own the axis-traction forceps, if they have relegated the induction of premature labor to the ash heap!

Another fad is birth control. This question need never have arisen. Grandin has never hesitated, after due consultation, to induce abortion where otherwise life was imperiled. The daily press—sometimes to the exclusion of war news—has exploited this advance guard of woman suffrage. To the medical press he would say that neither man nor woman should be entitled to procreate more children than they can rear.

The doctrine he preaches is not that of birth control, but that of *sex repression*.

The last fad has been of gradual development. Abraham Jacobi must smile in derision at the evolution of the scheme which will gradually place the infant at the mercy of modified milks and patented foods. Not every woman can be made to nurse her babe, but every woman should who can; structural mammary development or inherited or acquired disease being absent, Grandin can make 95 per cent. of his patients nurse their infants. A phase of this fad is to make the newborn child lengthen the nursing interval from 2 to 3 hours; fitting, as it were, the gastric capacity of the infant to the desire of the mother to, let us say, play bridge or go to the "movies." Read and mark and digest, ye iconoclasts and reformers! Read Father Abraham Jacobi's work on infant feeding, a classic always, and consult, incidentally, the chapter on the newborn infant, in Grandin's "Practical Obstetrics."

His concluding advice is: "Do the least harm, my medical friends, to woman and babe; study the methods of the past, hunt less eagerly for the new goods of foreign make; then, with asepsis as its keynote, you may reasonably hope to match the record of the master minds which has been my beacon."

Why the Midwife? asks J. C. Edgar.⁹ Hospital records bear out the fact that foreign-born women, after their first confinement under the care of the midwife, subsequently turn to the maternity hospital or a physician. After a short residence in this country, the ambition of a foreign-born woman is eventually to be in a financial position enabling her to employ a regular practitioner. During the existence of the Bellevue Midwife School, 235 midwives have been graduated; 5,125 confinements have been conducted by the pupils, 1,755 in the school, and 3,370 in the homes, with a maternal mortality of 0.7 per cent. Only three patients died in the school itself. Six others died after being transferred to Bellevue for operation. The 5,125 patients were practically all normal cases, as in dystocia, bleeding cases, and other abnormalities, the patients were sent

to Bellevue for treatment. As far as the handling of strictly normal cases by midwives go, the results have been excellent.

A plan for better and safer obstetrics in rural districts must recognize two main problems: 1. The best practical care of normal patients, and, 2, the detection of abnormal patients and their care.

By education and supervision the midwife may be rendered reasonably safe for strictly normal labor, safe even for a minimum of sepsis, or for the prevention of ophthalmia neonatorum; but she is not safe for the early care of prenatal complications, and fetal dystocia, which caused most of the infant and maternal mortality. Who should determine what is a strictly normal labor—the midwife? Never! Only the trained obstetrician can do so. The obstetrician must ever perform the prenatal examination and care. He must ever be at hand for the dystocia of labor and the postnatal complications.

[Not a strong argument for the midwife. Alas! the War has stopped our progress in the elimination of this anachronism (the midwife) as it has stopped advancement of many other worthy endeavors.—ED.]

Prenatal Care. The results obtained by the Division of Child Hygiene of Philadelphia, with its 48 nurses during 1916, are set forth by F. C. Child.¹ The area covered, exclusively in the poorer districts, is about 1/5 of the city. There is no central bureau for registration of maternity cases, but in spite of this fact, the nurses were able to help nearly 2,000 prospective mothers. Following are a few of the more interesting items from the Annual Report:

About one-third of the cases were cared for in their homes by private physicians. Approximately one-fourth were delivered at home by dispensary doctors, and the same number by midwives. The rest went into hospitals. Normal delivery, 1,775; abnormal delivery, 139; instrumental delivery, 58; hemorrhage, 1; prolonged labor, 64; breech, 3; twins, 4; placenta previa, 1; Cesarean section, 4; difficult delivery 4; abortion, 18; miscarriage, 13; total, 1,945.

Prematures, 25; Stillborn, 31; died in 24 hours, 41.

Breast fed, 1,830; artificially fed, 2; mixed feeding, 2.

The first visit of the nurse is more or less of a "feeler," in which she endeavors to make the mother understand she is there in a spirit of friendliness, rather than of investigation. At this time also she will see if the roof leaks, or there is water in the cellar, or if there are any other gross defects, but also if the house is orderly and well ventilated. The social condition may need adjusting—perhaps the father is out of work—perhaps the children need shoes. No matter what the existing conditions are, the nurse is the agency for referring those needing assistance to the various organizations giving it. The only actual material help given by the Division is free milk and, in the summer time, ice for prenatal cases unable to purchase it. Some 281 cases were thus supplied.

If the case appears to be normal, the nurse makes a visit once a month at first, then twice, and each week as the actual date of confinement is more nearly reached.

At the first visit the woman is told the necessity of placing herself under the care of a good physician or hospital (according to the income) if she has not already done so. The advisability of breast feeding is urged constantly. Most of the teaching deals with facts essential for the mother's guidance, facts of hygiene and normal living. At all times the effort is made to explain things in a manner that will be within their grasp.

Supervision of Expectant Mothers in New York. J. Sobel,² Chief of the Division of Baby Welfare in the Department of Health, states that the problem in New York, and that has remained practically unchanged for several years, is as follows:

1. Forty-one per cent. of all deaths under 1 year of age are due to congenital diseases.
2. Approximately 37 per cent. of all deaths under one occur during the first month of life.
3. About 75 to 80 per cent. of all deaths during the first month and approximately 90 per cent. of all during the first ten days are due to congenital diseases.
4. From 1884 to 1914, the death rates from diarrheal, respiratory, and contagious diseases have been markedly reduced—while that from congenital diseases has been reduced only 1.5 per cent. In fact,

during the past five years, the death rate from congenital diseases has remained practically stationary. 5. The death rate during the first month has remained practically unchanged for many years, while the total infant mortality rate and the rate from the second to the twelfth months have progressively declined:

Year*	Death rate under one month of age	Death rate from 2 to 12 months	Death rate under one year of age
1911	39.24	72	111
1913	37.69	63	100
1916	37.22	56	93

* Based on 52 weeks to the year.

6. While, in former years, diarrheal diseases occupied the first place in the list, today we find this taken by the congenital diseases, with respiratory diseases second and diarrheal third. 7. The majority of deaths due to congenital diseases are dependent upon the health and environment of the mother before birth of the child. 8. The number of maternal deaths incident to child bearing, while showing a reduction per 10,000 women from 15 to 44 years of age, and per 1,000 labors, is still too high. 9. The death rate from conditions associated with pregnancy, other than puerperal sepsis, has declined from 3.79 in 1898 to 2.9 in 1916. The puerperal sepsis death rate during the same period has decreased from 2.58 to 1.02.

The supervision of expectant mothers centers around the 59 baby health stations of the Department. Each of the eight "prenatal" nurses has her office at one of these stations, and draws her clientèle from the district boundaries of this station. The nurse holds office hours at the station every morning from 9 to 10 to advise mothers, and is on call for any special emergencies.

It is a fundamental policy of the Department that efforts be made to see the mothers as early in pregnancy as possible. If no attendant has been engaged, the nurse urges the mother to place herself under the care of a private physician or of a recognized maternity hospital or institution. Before the birth, visits are made, in normal cases, every three weeks up to the 5th month, and

then every ten days until delivery. In abnormal cases, as frequently as necessary. After the birth, visits are made every two days for a week in normal cases, and then every five days until the end of month. In abnormal cases, as frequently as the cases demand. At the termination of the case, every effort is made to persuade the mother to continue nursing the baby and to enroll it at the nearest baby station, provided no physician is in attendance.

The following is a summary of this work:

SUPERVISION OF EXPECTANT MOTHERS.

	1914	1915	1916
Number of mothers supervised.....	1,622	2,482	3,002
Number of mothers delivered.....	898	1,442	1,841
Percentage of mothers delivered.....	55.3	58.9	61.4
Number of mothers who died.....	2	0	2
Number of nurses	7	7	8

Average number supervised by each nurse. 231 354 375

If we presume that practically all the mothers delivered by midwives—46,487 in 1916—should receive prenatal care, and add to this a goodly proportion of those delivered in institutions, and in private practice, it will be no exaggeration to say that 75,000 mothers annually stand in need of such service. An analysis shows what concerted action can accomplish.

The number of children born prematurely has decreased from 11.1 per 1,000 children in 1914 to 8.1 in 1916. The stillbirth rate appears lower than that for this special work, but the term "stillbirth" as used in this report refers to the product of conception expelled from the uterus, dead, at any period of uterogestation, and under these circumstances the number of stillbirths reported officially to the Department is far smaller than those which actually take place. This is particularly those which actually take place.

The stillbirths in this tabulation represent actual figures, since all the mothers are under careful observation. If, as has been estimated, one stillbirth occurs for every four living births, then the number in New York during 1916 would have been, with the 137,000 living births, approximately 35,000, instead of some 6,253, the

basis upon which the city stillbirth rate was recorded. It is fair to assume that 35,000 stillbirths for New York, in the sense above noted, is a conservative estimate. There was an increased enrollment of mothers at the 5th month, increasing from 37 per cent. (1914) to 42 per cent. (1915) and 51 per cent. (1916). The death rate during the first month of life per 1,000 living births declined from 19.5 in 1914 to 13.7 in 1916, while the city rate per 1,000 living births practically remained stationary during these years. Finally, the percentage entirely breast fed at the end of the first month has been kept at a high standard, and the number of babies artificially fed kept correspondingly low.

[It is acutely necessary that we come to a general agreement as to what constitutes a stillbirth, an abortion, a miscarriage and a premature birth.—ED.]

Need For Intensive Study of Mortality From Childbearing. The attention directed to the reduction of infant mortality has conclusively demonstrated the necessity for a more complete supervision of the mother, both before and after labor, and as a result of this study, facts have been uncovered with reference to the mortality of childbearing that demand our best efforts for their possible correction. In this country no such decrease in the number of deaths associated with pregnancy has occurred as compared with those due to other causes; for while in the U. S. the death rate for typhoid between 1890 and 1913 fell from 46.3 to 17.9 per 100,000 of the population, for diphtheria from 97.8 to 1.8, for tuberculosis from 252 to 147.6, for pneumonia from 186.9 to 132.4, the total mortality associated with childbearing has not undergone any corresponding change. Thus, in 1891 the total mortality associated with the childbearing function was 15.3 and showed little variation up to 1913, when it was 15.8. These rates refer to the so-called registration area, between 65 and 70 per cent. of the total population. A further study of the last census shows the death rate per 100,000 women of childbearing age in 1900 totaled 50.3 and included 21.6 for puerperal sepsis alone. These figures may, perhaps, be criticised and a more accurate estimate would be one based on the number of deaths of mothers per 1,000 live

births. This has only been done in a very few States, but even here we note a rate of 6.5 per 1,000, or in larger figures and round numbers, about 3,600 out of 562,000 pregnancies with live births had a fatal termination. Here again, in about one-half puerperal septicemia in some form was the cause of death. Among the 16 leading nations of the world an examination of the death rate associated with pregnancy shows that the United States stands 14th.

If we admit the facts as stated what can be done to correct the same? G. W. Kosmak³ believes that an attempt should be made to disseminate a more widespread knowledge of the comparatively high mortality associated with childbearing, so the profession and the public, as well, shall be made aware of the necessity for concerted action and take steps to attain the same. Secondly, the preventable character of many of the fatal complications should be emphasized and due recognition accorded to the necessity for skilful attention for every pregnant woman. Thirdly, it seems essential that a more detailed study be made of the mortality statistics of pregnancy and labor, to determine among other things the antecedent history of the fatal cases and to separate in greater detail the various causes of death, for, at present, the usual classification includes merely septicemia on the one hand and the remaining factors on the other. This gives us little idea of the direction in which to apply either medical or social prophylaxis.

[There will not be any decrease in the mortality of childbirth until the standard of obstetrics is raised above the level which permits its practice by such women as existing midwives. The war will raise the deathrate of childbearing women, because our standards will be lowered. There will not be room for the tens of thousands of surgeons returning home after the war, and they will all feel like doing surgery. Let us get them to take up obstetrics, a field that promises interesting study and matters for investigation, and will win them the love of the mothers who are sacrificing so much for Liberty.

—ED.]

(3) Med. Record, March 9, 1918.

Some Aspects of Maternity and Child-Welfare Work. Sir Arthur Newsholme⁴ in his address to the county and local sanitary authorities of the county of Durham, stated that for the six years 1911-16 on an average 1,000 infants more died in that county per annum than the average for England and Wales as a whole.

Durham and Northumberland have the worst housing in the country. In Durham out of every 100 total dwellings at the last census 22 were found to comprise only two rooms as compared with 8.3 for England and Wales, and 27 of three rooms as compared with 14 for England and Wales; and the proportion per cent. of the population living more than two persons to a room, was 28.5 in the county as compared with 9.1 for England and Wales as a whole. It is legitimate cause for surprise that organized miners have not hitherto required, even though this implies higher rents, a minimum of sanitation and housing for their wives and children. Could anyone secure a more favorable record of sickness and death for one's children than holds good for the families of a large proportion of wage-earners in Durham and elsewhere if our houses had no larder for food, no sink, or a sink without hot water-supply over it, if the back yard and front and back street were unpaved, and if a malodorous ashpit and privy were in the near vicinity of the dwelling? Before we lay chief stress on ignorance and carelessness, it is our duty to ensure, so far as our individual power goes, that the local council and the landlord are supplying the rudimentary needs of sanitary living.

The achievements of the sanitary minimum of healthy family life, then, depends in the first instance on municipal and district sanitation and reasonably good housing. This implies convenient and labor-saving arrangements for personal and domestic cleanliness and for the storage of food.

The next great need is domestic assistance for the wife or mother, when without this her own or her children's health are likely to suffer. With this object in view the Local Government Board have decided to ex-

tend the scope of their 50 per cent. grants by including the provision of "home-helps" in suitable cases during the lying-in period. The avoidance of over-fatigue and anxiety at this period is essential, and the assistance of neighbors is not always available. The Board similarly are encouraging experiments in paying for the maintenance away from home of the older children during the same period. This is in addition to the already available grants of one-half of the cost of provision by the local authority of the cost of a midwife, or of a doctor called in to assist the midwife, or of a maternity nurse.

One result of bad housing conditions in Durham is that confinement has to take place in a house which commonly has only one bedroom, or at most two. A partial remedy for this is better housing; but even when this is available, in many cases the mother does not secure at home as good a prospect of healthy recovery as in a maternity home. The Board's grants are available for such homes; and Newsholme looks forward to the time when each area will have such a home, ensuring for the mother and the newly-born infant who need this assistance the best possible start in their next year's joint life.

In addition to child welfare centers with adequate ante-natal and infant consultation the Board's grants are now available also for hospitals for children under 5, not including ordinary infectious diseases, but including epidemic diarrhea; and for crèches provided by local authorities, for convalescent homes after confinement and for children after recovery from illness. Even more important, the Board are now able to promise grants for the maintenance of the infants of widowed, deserted, or unmarried mothers along with their infants in special homes or otherwise. The object of the last-named grant is the moral and hygienic gain both to the mother and infant which can only be secured by keeping them together.

The Maternity Hospital and Ante-Natal Centers. The agencies at present concerned with the preservation of the life and health of the pregnant and puerperal mother and her child might be classified ac-

cording to Comyns Berkeley⁵ into (1) The workers—midwives, doctors, health visitors, voluntary workers, and the municipal authorities. (2) The pregnant woman herself. (3) The local centres—various ante- and post-natal maternity centres, child welfare, etc. (4) The consultative centre, including the maternity hospital (or beds set apart in general hospitals or infirmaries).

(1) Out of every 100 pregnant women in England and Wales 75 are attended by *midwives*, the majority untrained. The midwife could help by sending or taking her patient to some local centre in her neighborhood and by filling up her register in an intelligent manner, so the health visitor or inspector of midwives would be able to advise her when she should recommend the patient to a local centre. The midwife was thus able to give her patient, among other things, the benefit of the consultative centre. With the exception that the women could go to an ante-natal centre or not as she pleased, or could decide upon this or that centre if she wished to attend one, of all the people comprised in these schemes for treating or helping the woman, the midwife was the only person whose services the woman could deliberately select. The midwife, therefore, was treated by these women as their confidant, and would have much more influence than, say, the voluntary worker, the doctors, the health visitor or the employers. It was most necessary to enlist the sympathies of the midwives, to show them that such schemes, far from interfering with their livelihood, would be the means of enhancing it, and would relieve them of a certain amount of responsibility, especially of that kind which they ought not to undertake.

(2) Everything must be done to encourage the *pregnant woman* to take an interest in the scheme, and to induce her to notify her pregnancy voluntarily. The majority did not consult a doctor until in many cases the opportunity of dealing successfully with complications was very much diminished if not lost. Dangerous labors and severe albuminuria complicated with eclampsia were comparatively rare in women of better social

position because they had in most cases engaged a doctor early. Pregnant women should be encouraged to attend local-centres and so indirectly consultative centres, so the diseases and complications of pregnancy might be dealt with at the earliest opportunity.

(3) A *local maternity centre* must be within easy reach of the women it proposes to help, attendance must be made as easy as possible, and they must not be required to spend very much time there. Each local centre should have a strictly defined area. Each local centre should be in touch with the doctors and midwives and voluntary workers in its area, as also with the consultative centre. The doctors of the neighborhood should be encouraged to take a particular interest in these local centres, for it was only so that the consultative centre would be able to do its best work.

(4) The functions of a maternity hospital or maternity department of a general hospital were:

- A. To act as a consultative centre to the local centres.
- B. To act as a training school for midwives, doctors, and health visitors.
- C. To undertake research work.
- D. To provide beds for pregnant, parturient, and puerperal women.

(A) To the *consultative centre* pregnant and puerperal women and in labor, as well as infants and children, could be referred for advice and treatment if necessary. Arrangements must be made for an expert in obstetric medicine to be in attendance at a certain hour, for a certain time, each week.

(B) The consultative centre should be regarded purely as a teaching centre, and deal principally with those patients who personally applied direct to the hospital, and not through the midwives and doctors, to be confined either as in- or out-patients. Women to be confined by midwives or doctors of their own choice should attend the local centre nearest to where they lived. The local centres must look on the consultative centre as their friend, to make use of it if they wished, and as really part of their own organization and a place where they were always welcomed. The officials of a consulta-

tive centre should be easy of access, in sympathy with the work being done at local centres, and interested in ante- and post-natal work beyond the limits of medical and surgical supervision.

(C) The consultative centre should have pathologic and chemical laboratories at which research work could be undertaken. Syphilis, *e. g.*, was a common cause of abortion and miscarriage, and the recognition of this cause would necessitate a clinical examination of the patient at the local centre and a confirmatory diagnosis, either by examination of the products of the pregnancy, or by the examination of the blood. Such work was properly carried out at the consultative centre; the requisite treatment could be applied in the case of a patient of a midwife, or prescribed if the doctor wished to carry out the treatment himself. Again, the toxemias of pregnancy called for research which could only be carried out at a hospital properly equipped.

(D) A certain number of beds should be set apart for pregnant, parturient, and lying-in women suffering from complications, and the local centres should have the right to send such patients for treatment without the troublesome formality of procuring in-patient letters, or the personal application to the hospital authorities. In Glasgow it had been found that 30 ante-natal beds were sufficient for the large number of local centres there. The local centres should work so well with the hospitals that a letter from the proper official that the case ought to be admitted should at once ensure admission if there were a vacant bed. The maternity hospital should also have beds for the immediate admission of patients of a local centre who were in labor and had some serious complications, and required expert treatment they were not able properly to obtain. It was probable that many suffering from puerperal sepsis would be saved if they could be admitted to hospital directly the symptoms declared themselves. For such cases separate wards or blocks and separate nursing staffs would be required, but at least 50 per cent. of the expenses could be recovered through the Local Government Board. Again, a laceration of the genital canal

might heal without any outward symptoms and yet the patient be handicapped for the rest of her life, whereas, if she could have been admitted the laceration could have been efficiently treated and the patient in the end be none the worse. Again, with a consultative centre situated at a general hospital or at a maternity hospital working in friendly agreement with a general hospital, facilities would be available for the proper treatment of such illnesses as heart disease or tubercle discovered in patients attending the consultative centre, but not directly attributable to their pregnancy; their in- or out-patient treatment could be arranged. Likewise surgical treatment and the treatment of infants and children could be undertaken in the best possible circumstances.

Extending the Care of Pregnancy. For 20 years, observes I. L. Hill,⁶ the death rate from childbirth has not decreased in America. Meanwhile many formidable diseases have yielded to medical science and claim fewer and fewer victims. Possibly more new measures have been brought forward for treatment of such diseases. But the means already at our command, if employed generally, could reduce this mortality.

For some reason, women in America receive bad obstetric care. Yet physicians attend the confinements more generally than in the European countries. This is not a country where the midwife flourishes. In the larger cities, where there are extensive foreign populations, there are many midwives. But the midwife has been regulated and closely watched. She has been taught just how far she must go and when she must call for medical assistance. Moreover, in what she is permitted to do, there are certain measures she must take, on penalty of losing her license. In other words, she is policed. The doctor is permitted to learn the right and wrong in obstetric practice, but he is policed only by his conscience. In America, it is the doctor who must institute the measures to raise the standard of midwifery.

It has been shown that pre-natal care will diminish maternal mortality and morbidity and will lessen the number of infant deaths in the first month of life, and

the number of still births. J. W. Williams has prepared for the Children's Bureau of the Department of labor the following fair standard of medical pre-natal care:

1. A general physical examination including heart, lungs, abdomen.
2. Measurement of the pelvis in a first pregnancy to determine whether there is any deformity likely to interfere with birth.
3. Continued supervision by the physician at least through the last five months.
4. Monthly examinations of the urine, at least during the last five months.

The Maternity Service Association (New York) has accepted as the minimum of prenatal care substantially the same standard, specifying also a blood-pressure estimation at each visit and a Wassermann in every suspicious case. But more than 70 per cent. of the women of New York are cared for by private physicians or midwives and are not included in the benefits of this newly created standard.

The Children's Bureau (Department of Labor) has made a study of obstetrics in the rural districts. In one district in a prosperous community 48 of the 50 mothers interviewed had been attended by a physician at their last confinement. Only seven mothers had had any prenatal care by a physician, one visit being paid in each case; and only three had had urinalysis. In another section, a plantation district in the South, of 50 women interviewed, 26 were white and 24 colored. Only ten white mothers were attended at their last labor by a physician. Fifteen white mothers and all 24 colored women were attended by colored midwives, not licensed, trained or supervised.

Our purpose must be to extend the care of pregnancy to all classes of women in the cities, towns, etc. Some progress has been made by certain townships, however, only a little here and there.

The problem is complex, is immediate, moreover it would seem to be a national one.

Sooner or later we shall have a national board of health and a medical cabinet officer. Let the govern-

ment begin with a national commission to conserve motherhood. Let this commission be empowered not only to study the question and to organize coöperation among existing agencies, but to spend money in creating a system of rural nursing. Let it create and train a body of government nurses. Let it establish, if it sees fit, prematurity hospitals for the reception of patients requiring close supervision and too remotely placed to obtain it. Let it furnish the money necessary to extend the work of organizations working along the same lines in the cities and towns. But great as is its scope, this work is not too large a problem for this nation, nor for the profession. Undertaken as a measure to economize life in this crisis of sacrifices for self-preservation, it will survive to ease the trials of womanhood when, once free from our torments, we may feel again the purpose of making life beautiful.

Eugenics Limited to the Care of Pregnant Women, Advocating Expectant Mother Hospitals and Special Dispensaries. This was the subject selected by Prof. Alfred Smith⁷ for his presidential address to the Section of Obstetrics (Royal Irish Academy of Medicine).

Biologically speaking, pregnancy represents the highest function of the female reproductive organs; it is also the most critical period of a woman's life. Because pregnancy is a physiologic condition it does not follow that the patient requires no care until parturition commences. On the contrary the border line between what is physiologic and pathologic is narrow. The pregnant woman should be under constant supervision. She needs judicious advice as to her mode of living. Particular attention should be given to the dietary, exercise, rest, sleep, and clothing. In other words she must be instructed in the hygiene and management of her pregnancy.

For the purposes of discussion, Smith divides pregnant women into two classes: (1) expectant mothers living in healthy surroundings, getting sufficient food; (2) expectant mothers living in unhealthy surroundings, getting insufficient food.

The first class require only passing notice. They should be encouraged, however, to engage their medical attendant at the earliest possible time after conception, so that they can be advised as to their mode of living during the intervening months, and they should be warned of the necessity to report at once any of the following symptoms: A scanty flow of urine, headache, constipation, black spots before the eyes, swelled feet or any loss of blood. Impressed with the good results to both mother and child obtained by a properly managed pregnancy, Whitridge Williams presents a card with printed instructions to all his patients, a practice which might be followed more widely in these countries.

Class 2.—Expectant mothers living in unhealthy surroundings with insufficient food.

That much can be done to influence the child in utero is well known and accepted; at any rate the tremendously high mortality among infants of less than a year old which prevails goes to show that many children are brought into the world very little fit to cope with the environment trials that there await them. The first steps in the direction of successful treatment of the unborn infant must be the successful treatment of the pregnant mother. She must have ample food and rest. In the British Isles there is no organized or deliberate effort to care, during the last month of pregnancy, for the wives of the poorer classes. Until the State recognizes its duty to the expectant mother to enable her to bring forth healthy offspring, all the efforts of humanitarians to reduce infant mortality are doomed to failure.

What expectant mothers require during the last month of their pregnancy is rest, food and instruction. How can we attempt to solve the problem of securing the needed rest, food and instruction? Through expectant mother hospitals and special dispensaries. To J. W. Ballantyne belongs the credit of being the first to advocate Pre-Maternity Hospitals. He does so in the *British Medical Journal* (April 6, 1901), in an article entitled "A Plea for Pre-Maternity Hospitals."

The Pre-Maternity Hospital need not be a separate establishment. It may quite well be an annex of the

maternity, but it must be distinct from the maternity. It will be for the reception of women who are pregnant, but who are not yet in labor. In the first place it will be for the reception of patients who have in past pregnancies suffered from one or other of the many complications of gestation; for working women who ought to rest during the last month of pregnancy, but who are unable from financial reasons to do so, and by patients who clamor for admittance to our maternities, but who are told to come back again when the "pains have begun." It is worth while for us to realize that practically no provision is made in existing hospitals for pregnant women. In general hospitals cases of morbid pregnancy, for example, hyperemesis gravidarum, are sometimes received and treated, but mostly under protest, lest there occur a birth in the wards. In maternities pregnant women are not welcome much before the full term of gestation, for obvious reasons. Such patients would be received into the pre-maternity; it would be their special hospital. When labor pains came on they would be transferred to the adjoining maternity.

The scope of Dr. Ballantyne's pre-maternity hospital is limited. Smith's idea is a hospital where expectant mothers could get needful rest during the last month of their pregnancy, and where they could receive an ample supply of simple nourishing food. Such a hospital should have attached to it a competent medical officer capable of carrying out scientific observations having a bearing on the pathology of pregnancy, and the conditions that lead to malformations of infants.

He advocates the principle of expectant mother hospitals and that they should be endowed by the State. In this time of stress and scarcity of necessary foods the requirements of poor expectant mothers must be considered; their food, in the words of Dr. Jellett, must be simple, ample and nourishing. Under the present economic conditions they cannot provide the proper food in ample quantities. The coming race must necessarily suffer, and the mortality of children under one year go on increasing. A scheme of this kind, to be effective, must be big and comprehensive; half-hearted measures will end only in failure.

If the State were ever to subsidize expectant mother hospitals to house the very poor expectant mothers during the last month of their pregnancy now is the time. Temporary buildings could be obtained which would tide over the immediate necessity, and later on larger and more elaborate institutions could be erected and the scheme amplified. Smith's contention is that the coming generation must have first claim on the State. It is all very proper that Lunatic Asylums should receive a grant in aid, and that the expenses incurred by local authorities in carrying out the new treatment of venereal disease should be indemnified to the extent of 75 per cent. of their expenditure. Once the truth is brought home and pressed home that children must be saved, and can be saved, by the proper care and feeding of the expectant mother, the case is won.

Unfortunately many deserving mothers cannot for many reasons avail themselves of those hospitals; they have to work up to the time that labor begins. For such, special dispensaries could be opened, and pregnant women should be encouraged to come there and get advice. A scheme for feeding the necessitous mothers could be formulated. It is just as essential to nourish the infant through the mother during the last month of pregnancy as it is to feed the baby after birth.

[The War has drawn the attention of the public and the State to the needs and sufferings of the child-bearing mother, and we can confidently expect an amelioration of their neglected condition and an improvement in the standard of Obstetrics.—ED.]

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